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THE TRANSACTIONS

OF THE

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.



THE TRANSACTIONS

OF THE

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH.

VOL. IX.---NEW SERIES.

SESSION 1889-90. NOV 2 9 2002 NIVERSI ORO BURGH: OLIVER AND BOYD, PUBLISHERS TO THE SOCIETY. 1890.

PRINTED BY OLIVER AND BOYD, TWEEDDALE COURT, EDINBURGH.



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PREFACE.

THE present Volume is the *Ninth* of the *New Series*, and contains a record of the work done during the past Session.

That work, as hitherto, embraces the communication of Original Papers; the exhibition of Patients, illustrating rare and interesting forms of disease; and the exhibition of Pathological and other specimens, so essential to the proper understanding of the morbid changes which take place in the human body.

During the past Session two Extra Meetings were held for Discussions on Special Subjects,—one on the Physiology of Education, introduced by Dr John Strachan of Dollar, and the other on Influenza, opened by Dr David J. Brakenridge. It is hoped that such Meetings will materially increase the usefulness of the Society.

It is believed that the publication of the Transactions in this permanent form will prove a valuable contribution to medical literature, will encourage the Members to take a more active part in the work of the Society, and will tend in no small degree to increase the influence and usefulness of the Medico-Chirurgical Society of Edinburgh.

> WILLIAM CRAIG, Editor.

October 1890.

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	* Thomas Rutherford Ronaldson, M.B., F.R.C.P.Ed., 3 Brunts-	
	field Terrace,	1877
	Surgeon-Major William T. Black, M.D., F.R.C.S. Ed.,	
	2 George Square,	1877
0.5	* Johnson Sumington M.D. F.P.C.S.E. M.P.C.S.F.	1877
90	Greenhill Park	1878
	David Menzies, M. B., F.R.C.S. Ed., 20 Rutland Square	1878
	* Joseph Montagu Cotterill, M.B., F.R.C.S. Ed., 23 Walker	1010
	Street,	1878
	George Mackay, M.B., F.R.C.S. Ed., 24 Gilmore Place	1878

		Admission
	* John Graham Brown, M.D., F.R.C.P. Ed., 16 Ainslie Place, .	1878
100	Alexander Robert Coldstream, M.D., F.R.C.S. Ed., Florence,	
	Italy,	1878
	James Allan Philip, M.D., Kue Victor Hugo, Boulogne-Sur-Mer,	1878
	John Shahd, M.D., F.A.C.F. Ed., 34 Albany Street, .	1878
	William Barrie Dow M.D. F.R.C.S.Ed. Dunformline	1878
105	Richard Freeland M.B. C.M. Broxburn	1879
105	* Peter M'Bride M D F R C P Ed 16 Chester Street	1870
	* James Allan Gray M D F R C P Ed 107 Ferry Road	1879
	William Stewart M B C M Kirkwall	1879
	Charles H. Fasson, Dep. Surgeon-General, Royal Infirmary.	1879
110	* A. D. Leith Napier, M.D., C.M., 67 Grosvenor Street, Grosvenor	10,0
	Square, London, W.,	1879
	Andrew Fleming, M.D., Dep. Surgeon-General, 8 Napier Road,	1880
	* Thomas Duddingston Wilson, M.B., F.R.C.S. Ed., 10 Newing-	
	ton Road,	1880
	* George Alexander Gibson, M.D., F.R.C.P. Ed., 17 Alva Street,	1880
	* George Leslie, M.B., C.M., Old Manse, Falkirk,	1881
115	Robert Lawson, M.D., C.M., 24 Mayfield Terrace, .	1881
	John Hutton Balfour, M.B., C.M., Portobello,	1881
	* Alexander Hugh Freeland Barbour, M.D., F.K.C.P. Ed.,	
	24 Melville Street,	1881
	* Alexander Matthew F. P. O.S. Ed. Constanting	1882
190	Lohn Archibald M.D. F.P.C.S. Ed., Corstorphine,	1882
120	Longhborough	1000
	* James Maxwell Ross M.B. F.B.C.S. Ed. 112 Gilmore Place	1882
	John Carlyle Johnstone M.B. C.M. Melrose Asylum	1882
	James Rutherford Morison M.D. F.R.C.S.Ed 14 Saville	1002
	Row. Newcastle-on-Tyne.	1882
	Roderick Maclaren, M.D., 23 Portland Square, Carlisle,	1882
125	* W. Wotherspoon Ireland, M.D., Prestonpans, .	1883
	Francis Mitchell Caird, M.B., F.R.C.S. Ed., 21 Rutland Street,	1883
	F. W. Dyce Fraser, M.D., F.R.C.P. Ed., Gorton House,	
	Hawthornden, Lasswade,	1883
	Robert Henry Blaikie, M.D., F.R.C.S. Ed., 42 Minto Street, .	1883
	R. M'Kenzie Johnston, M.D., F.R.C.S Ed., 44 Charlotte Square,	1883
130	* Charles Walker Cathcart, M.B., F.R.C.S. Eng. and Ed., 8	
	Randolph Crescent,	1883
	Alexander Bruce, M.D., F.R.C.P. Ed., 13 Alva Street,	1883
	Andrew Semple, M.D., F.K.C.S. Ed., Dep. Surgeon-General,	1009
	William Hy Shimoff M.R. C.M. Molhoumo Australia	1883
	John Luon Wilson J. B. C. P. Ed. A Busslensh Place	1883
135	Hanry Newcombe M.D. F.R.C.S. Ed. 5 Dalrymple Crossent	1665
100	* Francis Troup M D M R C P Ed 1 Minto Street Treasurer	1883
	Russell Eliott Wood, M.B., F.B.C.S. Ed., 9 Darnaway Street	1883
	John Macdonald Brown, M.B., F.R.C.S. Eng. & Ed., 12	1000
	South Mansionhouse Road.	1883
	James William Beeman Hodsdon, M.D., F.R.C.S. Ed., 30	
	Walker Street,	1883
140	John Haddon, M.D., C.M., Marsh House, Canonbie .	1883
	* Germon Sims Woodhead, M.D., F.R.C.P. Ed., Beverley,	
	Nightingale Lane, Balham, London,	1883
	Thomas Francis Spittal Caverhill, M.B., F.R.C. P. Ed., 8A Aber-	
	cromby Place,	1883
	Kobert Alexander Lundie, M.B., B.Sc., F.K.C.S. Ed., 35	1000
	Warrender Fark Road,	1883
	22 St John Street Manuhester	1992
145	Edwin Baily M.B. C.M. Ohan	1883
1 1 1	initial Dally, M. D., C. M., Oball,	1000

		Date of
	Alexander Black M.B. F.R.C.P.Ed. 13 Hours Street	1883
	Harry Malvilla Duplon M D F R C P Ed 20 Abergromby	1000
	Place	1883
	George Andreas Berry M.B. F.B.C.S.Ed. 31 Drumsheugh	1000
	Gardens	1883
	Hamilton Wylie, M.B., C.M., 1 George Place,	1883
150	Arthur Douglas Webster, M.D., F.R.C.P. Ed., 20 Newington	
100	Road.	1883
	Robert William Philip, M.D., F.R.C.P. Ed., 4 Melville	
	Crescent,	1883
	Joseph Carne Ross, M.D., F.R.C.P. Ed., 98 Mosley Street,	
	Manchester,	1884
	William Russell, M.D., F.R.C.P. Ed., 46 Albany Street,	1884
	George Dickson, M.D., F.R.C.S. Ed., 9 India Street, .	1884
155	Thomas Wyld Pairman, L.R.C.P. & S. Ed., Te Awamutu,	1004
	Waipa, Auckland, N.Z.,	1884
	Alexander Thom, M. D., U.M., Uriell,	1884
	Hugh Logan Calder, M.D., C.M., 60 Leith Walk,	100#
	James Graig Ballour, L.R.C.F. & S. Eu., Seatstone Louge,	1994
	Frederick Anastasius Soundars L. P. C. P. Ed. F. R. C. S. Ed.	1004
	Denhurn Crail	1884
160	Wm Richardson, M.D., F.B.C.S. Ed., Bath Lodge, Reading,	1884
100	Andrew Brown, M.D., M.R.C.P. Ed., 1 Bartholomew Road,	
	Kentish Town, London, N.W.	1884
	G. J. H. Bell, M.B., C.M., Surgeon, Bengal Army, .	1884
	T. Goodall Nasmyth, M.D., D.Sc., Cowdenbeath, Fife,	1884
	Henry Hay, M.B., C.M., 7 Brandon Street,	1884
165	Thomas R. Scott, M.D., C.M., Musselburgh,	1884
	R. Milne Murray, M.B., F.R.C.P. Ed., 10 Hope Street,	1884
	A. S. Cumming, M.D., F.K.C.P. Ed., 18 Amshe Place,	1884
	Ernest F. Neve, M.D., F.R.C.S. Ed., M.R.C.S. Eng., Hospital,	1881
	W C Greig M B C M Tangier Morocco	1884
170	John Mowat, M. D., 1 Hope Park Terrace.	1885
	Skene Keith, M.B., F.R.C.S. Ed., 42 Charles Street, Berkeley	
	Square, London, W.,	1885
	D. Noël Paton, M.D., F.R.C.P. Ed., 4 Walker Street,	1885
	George Hugh Mackay, M.B., C.M., Elgin,	1885
	Michael Dewar, M. D., C. M., 24 Lauriston Place,	1885
175	Edward M'Callum, F.K.C.S. Ed., 3 Brandon Street, .	1885
	T. Edgar Undernin, M.D., F.R.C.S. Ed., Dromsgrove, wor-	1995
	John Struthers Stewart L. R.C.P. & S. Ed. 16 Merchiston	1005
	Terrace.	1885
	Allen Thomson Sloan, M.D., C.M., 22 Forth Street, .	1885
	John William Ballantyne, M.D., F.R.C.P. Ed., 50 Queen St.,	1885
180	James Robertson Crease, F.R.C.S. Ed., 2 Ogle Terrace, South	
	Shields,	1885
	George Kerr, M.B., C.M., 6 St Colme Street, .	1885
	Tom Bairstow, L.R.C.P. & S. Ed., 14 Buccleuch Place,	1885
	David Milligan, M.B., C.M., 11 Palmerston Place, .	1885
105	George Dous, M.D., L.R.C.S. Ed., 50 Great King Street,	1885
185	Pohert W Felkin M D F R C S Ed 20 Alva Street	1885
	S Hale Puckle M.B., C.M., Bishop's Castle, Shroushire,	1885
	James Haig Ferguson, M.D., F.R.C.P. Ed., M.R.C.S. Eng., 25	2000
	Rutland Street,	1885
	Charles Kennedy, M.D., C.M., 25 Newington Road, .	1886
190	William Gayton, M.D., M.R.C.S. Eng., Bartram Lodge, Fleet	
	Road, Hampstead, London, N.W.,	1886
	Reginald Ernest Horsley, M.B., F.R.C.S. Ed., 46 Heriot Row,	1886

		Date of
	James Mill, M.B., C.M., 178 Ferry Road,	1886
	Robert Fraser Calder Leith, M.B., B.Sc., 129 Warrender	
	Park Road,	1886
	Thomas M. Burn-Murdoch, M.B., C.M., 31 Morningside Road,	1886
195	Professor William Smith Greenfield, M.D., F.R.C.P. Lond.	1000
	and Ed., 7 Heriot Row,	1886
	Uswald Ghiespie wood, M.D., F.R.C.S. Ed., Surgeon, Army	1886
	James Hogarth Pringle, M.B., C.M., 5 Livingstone Place.	1886
	Nathaniel Thomas Brewis, M.B., F.R.C.P. Ed., 59 Queen Street.	1886
	John Batty Tuke, jr., M.D., F.R.C. P. Ed., Balgreen, Murray-	
	field,	1886
200	David Berry Hart, M.D., F.R.C.P. Ed., 29 Charlotte Square, .	1886
	Walter Scott Lang, M.D., F.R.C.S. Ed., M.R.C.S. Eng.,	1000
	Alfred Ball Whitten M.B. C.M. Aberehirder	1886
	Robert S. Aitchison, M.B., F.R.C.P. Ed. 74 Great King	1000
	Street.	1887
	J. A. Armitage, M.D., C.M., 15 Waterloo Road, Wolverhampton,	1887
205	J. Walton Hamp, L.F.P.S. Glasg., L.S.A. Lond., Wolver-	
	hampton,	1887
	William Hunter, M.D., M.R.C.S. Eng., 16 Panton Street,	1007
	Sudney Rumbell L R C P Ed E R C S Ed Belgeum House	1007
	Leeds	1887
	John Thomson, M.B., F.R.C.P. Ed., 14 Coates Crescent,	1887
	George Franklin Shiels, M.D., C.M., 229 Geary Street, San	
	Francisco,	1887
210	T. Brown Darling, M.D., C.M., 36 South Bruntsfield Place,	1887
	John Keay, M.B., M.R.C.P. Ed., Mavisbank House, Polton,	1887
	Edward Carmiubael M.D. 12 London Street	1887
	Charles C. Teacher, M.B., C.M., 16 Newington Boad.	1887
215	David W. Aitken, M.B., C.M., 17 Hatton Place,	1887
	Robert Inch, M.B., C.M., Gorebridge,	1887
	John Shaw M'Laren, M.B., F.R.C.S. Ed., 14 Walker Street, .	1887
	George Mackay, M.D., F.R.C.S. Ed., M.R.C.S. Eng., 2	1007
	Hanny Alaria Thomson M.D. F.R.C.S.Ed. 2 Costos Crossont	1007
220	David Wallace M B., F R C S Ed., 66 Northumberland Street.	1887
220	John C. Messer, M. D., R. N., 15 Belgrave Place,	1887
	Thomas W. Dewar, M.B., F.R.C.P. Ed., 27 Clephane Road,	
	Canonbury, London, N.,	1887
	D. H. Anderson, M. B., C. M., Borough Asylum, Hull,	1887
005	James Lockhart Wilson, M.B., C.M., Duns,	1888
220	John M'Fadvean M.B. C.M. 9 East Hermitage Place Leith	1888
	Thomas Russell, L.F.P.S. Glasg. Davidson's Mains.	1888
	John Ross Home Ross, M.B., F.R.C.P. Ed., 40 York Place,	1888
	George M. Johnston, M.D., C.M., 9 Morton Street, Leith, .	1888
230	George Pirrie Boddie, M.B., C.M., 28 South Bruntsfield Place,	1888
	Kenneth Mackinnon Douglas, M.D., F.R.C.S. Ed., 32 Alva	1000
	Correct ovell Culland M.D. M.P.C.P.Ed. 6 Pandolub Place	1000
	William Burns Macdonald M B C M Port Lodge Dunbar	1888
	James Williamson Martin, M.D., M.R.C.P. Ed., Gie Appantoo.	1000
	Axim, Gold Coast, Africa,	1888
235	Charles H. Bedford, M.B., B.Sc., M.R.C.S. Eng., Indian	
	Medical Service, care of Messrs W. Watson & Co., 27	1000
	William Holdona M.D. F.F.D.S. Clagge Viewforth Dailage	1889
	of Allan.	1889
		1000

		Date of Admission
	John Hugh Alex. Laing, M.B., C.M., 11 Melville Street,	1889
	Harold Jalland Stiles, M.B., F.R.C.S. Ed., 5 Castle Terrace, .	1889
	John Smith, M.D., M.R.C.S. Eng., Brycehall, Kirkcaldy,	1889
240	Allan Cuthbertson Sym, M.D., C.M., 144 Morningside Road, Edmund Frederick Tanney Price, M.B., C.M., 28 Mayfield	1889
	Road,	1889
	John Berry Haycraft, M.D., Sc.D., 20 Ann Street, .	1889
	Henry Harvey Littlejohn, M.B., F.R.C.S. Ed., 24 Royal Circus,	1889
	Albert Edward Morison, M.B., F.R.C.S. Ed., M.R.C.S. Eng.,	
	Brougham Terrace, Hartlepool,	1889
245	William George Sym, M.D., F.R.C.S. Ed., 58 Queen Street,	1889
	Benjamin D. C. Bell, L.R.C.P. and S. Ed., Kirkwall,	1889
	Hugh Jamieson, M.B., C.M., care of A. W. Hutton, Esq.,	
	M.A., 479 Avenida Montesdeoca, Buenos Ayres,	1889
	David Gair Braidwood, M.B., C.M., Halkirk, Caithness, .	1889
	A. Home Douglas, M.B., C.M., 6 Grosvenor Street,	1889
250	Alexander John Keiller, L.R.C.P. and S. Ed., 21 Queen Street,	1889
	G. Keppie Paterson, M.B., C.M., 17 Forth Street.	1889
	William Stewart, M.D., F.F.P.S. Glasg., 105 Ferry Road, Leith, Alfred William Hughes, M.B., F.R.C.S. Ed., M.R.C.S. Eng.	1889
	42 George Square,	1889
	Thomas Proudfoot, M.B., M.R.C.P. Ed., 13 Lauriston Place, .	1889
55	William H. Barrett, M.B., C.M., 21 Learmonth Terrace,	1890
	Dawson Fyers Duckworth Turner, M.D., M.R.C.P. Ed., 7	1900
	George Square,	1890
	Laward Farr Armour, M.D., C.M., Kildonan, Craigmillar Park,	1890
	William Curry L D O D and S Ed 11 Warman Disco	1890
	winnam Guy, L.A.O.F. and S. Ed., 11 Wemyss Place, .	1890

NON-RESIDENT.

260	Arthur Edward Turnour, M.D., M.R.C.S. Eng., Denbigh,	1843
	W. Ord M'Kenzie, M.D., L.R.C.S. Ed., London,	1845
	W. Judson Van Someren, M.D., L.R.C.S. Ed., Redhill, Surrey,	1845
	William H. Lowe, M.D., F.R.C.P. Ed., Wimbledon, .	1845
	George Skene Keith, M.D., F.R.C.P. Ed., Currie,	1845
265	Veitch Sinclair, L. R. C. P. and S. Ed., London,	1850
200	Archibald Hall, M.D., Montreal,	1853
	W. Overend Priestley, M. D., LL. D., F. R. C. P. Ed., London.	1854
	Horatio Robinson Storer, M.D., Newport, Rhode Island, U.S.,	1855
	James C. Howden, M.D., Montrose,	1856
270	Thomas Skinner, M.D., L.R.C.S. Ed., London,	1856
	Professor William Smoult Playfair, M.D., LL, D., F.R.C.P.L.	
	London.	1857
	J. Ivor Murray, M.D., F.R.C.S. Ed., Scarboro',	1857
	Andrew Scott Myrtle, M. D., L. R. C.S. Ed., Harrogate,	1859
	Robert Foulis, M.D., F.R.C.S. Ed., Cupar-Fife,	1859
275	Francis Robertson Macdonald, M.D., Inveraray,	1860
210	Professor John Young, M.D., University of Glasgow, .	1860
	Norman Bethune, M.D., F.R.C.S. Ed., Toronto,	1861
	George Thin, M.D., L.R.C.S. Ed., London,	1861
	Peter Gordon, L.R.C.P. and S. Ed., Juniper Green,	1861
280	J. Cecil Phillippo, M.D., Kingston, Jamaica, .	1861
200	Professor William Stephenson, M.D., F.R.C.S. Ed., Aberdeen,	1861
	J. S. Beveridge, M.R.C.P. Lond., F.R.C.S. Ed., Edenbridge, .	1861
	David Yellowlees, M.D., LL.D., F.F.P.S. Glasg., Glasgow, .	1862
	Prof. Arthur Gamgee, M.D., F.R.C.P. Ed., F.R.S., London, .	1864
285	Professor John Cleland, M.D., LL.D., The University, Glasgow,	1864
100	R. B. Finlay, M.D., Q.C., M.P., Middle Temple, London, .	1864
	Stanley Lewis Haynes, M.D., M.R.C.S. Eng., Malvern,	1864
	Francis D. A. Skae, M.D., Lerwick,	1864
	James Watt Black, M. D., F. R. C. P. L. London,	1865

		Date of Admission
290	David Brodie, M.D.	1865
	Thomas Sheriff, L. R. C. P. and S. Ed., Edinburgh,	1867
	Peter Maury Deas, M. B., L. B. C. S. Ed., Exeter,	1868
	Professor J. G. M'Kendrick, M.D., LL, D., F.R.C.P. Ed.,	
	University, Glasgow.	1870
	Professor Lawson Tait, M.D., F.R.C.S. Ed. and Eng., LL.D.,	
	Rirmingham.	1870
295	J. G. Sinclair Coghill, M. D., F. R.C.P. Ed., Ventnor.	1870
	James Johnston, M. D., F. R.C.S. Ed., London,	1871
	J. William Eastwood, M. D., M. R.C. P. L. Darlington,	1871
	Professor J. Bell Pettigrew, M.D., LL.D., F.R.C.P. Ed., Uni-	
	versity of St Andrews.	1873
	J. Johnson Bailey, M. D., F. R. C. S. Ed., Marple,	1874
300	John Aymers Macdongall, M.D., F.R.C.S. Ed., Carlisle,	1875
	Thomas John Maelagan, M.D., M.R.C.P.L., London,	1875
	Dr Groesbeck. Cincinnati.	1875
	Professor David James Hamilton, M.B., F.R.C.S. Ed., Aber-	
	deen University,	1876
	J. Moolman, M.B., C.M., Cape of Good Hope,	1877
305	Robert Somerville, M.D., F.R.C.S. Ed., Galashiels, .	1877
	Graham Steell, M.D., F.R.C.P.L., Manchester,	1877
	Frederick William Barry, M.D., D.Sc., London,	1878
	John Brown, M.D., F.R.C.S. Eng., Burnley,	1878
	Walter Weir, M.B., F.R.C.P. Ed., London,	1879
310	Keith Norman Macdonald, M.D., F.R.C.P. Ed., Bridge of	
	Allan,	1880
	John Home Hay, M.D., M.R.C.S. Eng., Alloa,	1880
312	John Maekay, M.D., L.R.C.S. Ed., Aberfeldy, .	1881

ORDINARY MEMBERS

ARRANGED ALPHABETICALLY.

RESIDENT.

	Dr J. O. Affleck, 38 Heriot Row,		1871
	Dr R. S. Aitchison, 74 Great King Street,		1887
	Dr D. Aitken, 17 Hatton Place,		1887
	Dr D. H. Anderson, Borough Asylum, Hull,		1887
5	Dr James Andrew, 2 Atholl Crescent, .		1869
-	Professor Annandale, 34 Charlotte Square,		1863
	Dr Archibald, Woodhouse-Eaves, Loughborough,		1882
	Dr J. A. Armitage, 15 Waterloo Road, Wolverhampton.		1887
	Dr E. F. Armour, Kildonan, Craigmillar Park.		1890
10	Dr W. Badger, Penicuik,		1882
	Dr Edwin Baily, Oban.		1883
	Tom Bairstow, Esg., 14 Buccleuch Place,		1885
	Dr Andrew Balfour, Portobello,		1874
	Dr J. H. Balfour, Portobello,		1881
15	Dr G. W. Balfour, 17 Walker Street,		1874
	Dr James Craig Balfour, Seatstone Lodge, Malvern Wells	,	
	Worcestershire,		1884
	Dr Thomas Balfour, 51 George Square,		1856
	Dr Alexander Ballantyne, Dalkeith,		1872
	Dr J. W. Ballantyne, 50 Queen Street,		1885
20	Dr A. H. Freeland Barbour, 24 Melville Street,		1881
	Dr W. H. Barrett, 21 Learmonth Terrace, .		1890
	Dr C. H. Bedford, Indian Medical Service, care of Messrs W.		
	Watson & Co., 27 Leadenhall Street, London, E.C.,		1889
	Dr Benjamin D. C. Bell, Kirkwall,		1889
		3	

xviii ALPHABETICAL LIST OF MEMBERS OF THE SOCIETY.

		Date of
	Dr G. J. H. Bell, Surgeon, Bengal Army,	1884
25	Joseph Bell, Esa., 2 Melville Crescent.	1862
	G. H. Bentley, Eso., Kirkliston,	1877
	Dr G. A. Berry, 31 Drumsheugh Gardens.	1883
	Dr Alexander Black, 13 Howe Street, .	1883
	Dr W. T. Black, 2 George Square	1877
30	Dr Robert H. Blaikie, 42 Minto Street,	1883
	Dr Bleloch, 2 Lonsdale Terrace,	1871
	Dr G. P. Boddie, 28 South Bruntsfield Place,	1888
	William Booth, Esq., 2 Minto Street,	1888
	Dr D. G. Braidwood, Halkirk, Caithness,	1889
35	Dr Brakenridge, 10 St Colme Street, Vice-President, .	1865
	Dr Byrom Bramwell, 23 Drumsheugh Gardens,	1876
	Dr N. T. Brewis, 59 Queen Street,	1886
	Dr Brown, 1 Bartholomew Road, Kentish Town, London, N.W.,	1884
10	Dr J. Graham Brown, 16 Ainshe Place,	1878
40	Dr J. Macdonald Brown, 12 South Mansionhouse Road,	1883
	Dr J. Murdoch Brown, 9 Walker Street,	1885
	Dr Alexander Bruce, 13 Alva Street,	1883
	Dr Robert Bruce, 12 York Place,	1898
15	Dr Duist, I Cinton Terrace,	10//
40	Dr Codell 22 Ainglie Place	1870
	Dr Francis M Caird 91 Butland Street	1882
	Dr H L Calder 60 Leith Walk	1884
	Dr W. Watson Campbell Duns	1877
50	Dr Cappie 37 Lauriston Place	1855
00	Dr Edward Carmichael 12 London Street	1887
	Dr J. Carmichael. 22 Northumberland Street.	1870
	Dr C. W. Cathcart, 8 Randolph Crescent.	1883
	Dr T. F. S. Caverhill, 8A Abereromby Place.	1884
55	Professor John Chiene, 26 Charlotte Square,	1867
	Dr Church, 36 George Square, .	1876
	Dr Clouston, Tipperlinn House, Morningside Place, Vice-	
	President,	1861
	Dr A. R. Coldstream, Florence, Italy,	1878
	Dr John Connel, Peebles,	1876
60	Dr Cotterill, 23 Walker Street,	1878
	Dr William Craig, 7 Bruntsheld Place,	1869
	Dr J. R. Crease, 2 Ogle Terrace, South Shields,	1885
	Dr Halliday Croom, 25 Charlotte Square,	1870
65	Dr P. I. P. Cummahama, 18 Pathagar Diago	1004
00	Dr I. P. Davling 26 South Bruntafield Place	1000
	Dr M. Dewar 24 Lauriston Place	1885
	Dr T. W. Dewar, 27 Clephane Road Canonbury London N	1887
	Dr Archibald Diekson, Hartree House Biggar	1871
70	Dr George Dickson, 9 India Street.	1884
	Dr George Dods, 50 Great King Street,	1885
	Dr Halliday Douglas, 30 Melville Street.	1842
	Dr A. Home Douglas, 6 Grosvenor Street,	1889
	Dr Kenneth M. Douglas, 32 Alva Street,	1888
75	Dr William B. Dow, Dunfermline,	1879
	Dr John Duncan, 8 Ainslie Place,	1868
	Dr Kirk Duncanson, 22 Drumsheugh Gardens,	1871
	Dr H. M. Dunlop, 20 Abercromby Place,	1883
	Dr J. Dunsmure, 53 Queen Street,	1872
80	C. H. Fasson, Esq., Dep. SurgGen., Royal Infirmary,	1879
	Dr R. W. Felkin, 20 Alva Street,	1885
	Dr J. Haig Ferguson, 25 Rutland Street,	1885
	Dr W. A. Finlay, St Helen's, Russell Place, Trinity, .	1875
	Dr Andrew Fleming, 8 Napier Road,	1880

85

	Di bolin Flaser, 15 bela metalin fload,	1070
	Professor Thomas R. Fraser, 13 Drumsheugh Gardens,	1865
	Dr R. Freeland, Broxburn,	1879
90	Dr Garland, 35 Charlotte Street, Leith,	1873
	Dr. W. Gayton, Bartram Lodge, Fleet Road, Hampstead,	
	London N W	1886
	Du C A Cibron 17 Alvo Street	1990
	Dr G. A. Gioson, 17 Alva Street,	1000
	Dr James D. Gillespie, 10 Walker Street,	1852
	G. R. Gilruth, Esq., 48 Northumberland Street,	1869
95	Dr J. Allan Gray, 107 Ferry Road,	1879
	Professor Greenfield, 7 Heriot Row,	1886
	Dr David Greig 38 Coates Gardens	1854
	Dr W C Greig Tangier Morocco	1884
	Dr G. I. Gulland, 6 Randolph Place	1888
100	Dr D. H. Gunning, J. Allien, Consent West Vensionater	1000
100	Dr R. H. Gunning, 12 Addison Crescent, west Kensington,	1010
	London, W.,	1840
	Dr William Guy, 11 Wemyss Place,	1890
	Dr John Haddon, Marsh House, Canonbie,	1883
	Dr William Haldane, Viewforth, Bridge of Allan,	1889
	Dr J. W. Hamp, Wolverhampton,	1887
105	Professor A. W. Hare, 23 St John Street, Manchester,	1883
	Dr D Berry Hart 29 Charlotte Square.	1886
	Dr Henry Herr 7 Branden Street	1984
	Dr I Danue Harrow ft 20 Ann Street	1001
	D L L L	1009
	Dr John Henderson, 4 John's Place, Leith,	1848
110	Dr J. W. B. Hodsdon, 30 Walker Street,	1883
	Dr R. E. Horsley, 46 Heriot Row,	1886
	Dr A. F. Hughes, 42 George Square,	1889
	Dr George Hunter, 33 Palmerston Place	1876
	Dr James Hunter, South Queensferry,	1890
115	Dr W. Hunter 16 Panton Street Cambridge	1887
***	Dr Husband 4 Royal Circus	1849
	Emprois D. Indoch For 10 Outers Street	1012
	Dr. Datast Inch. Constraine	1040
	Dr Kobert Inch, Gorebridge,	1007
	Dr W. Wotherspoon Ireland, Prestonpans,	1883
120	Dr James, 44 Melville Street,	1877
	Dr Allan Jamieson, 35 Charlotte Square,	1876
	Dr Hugh Jamieson, eare of A. W. Hutton, Esq., M.A., 479	
	Avenida Montesdeoca, Buenos Avres.	1889
	Dr James Jamieson, 43 George Square,	1877
	Dr G. M. Johnston, 9 Morton Street Leith	1888
195	Dr R. McKenzie Johnston 44 Charlotte Square	1883
1 40	Dr I. Carlyla Laburtana Malucas durhum Mulucas	1000
	Dr J. U. Maricharle Hanne Delta	1004
	Dr J. Keay, Mavisbank House, Polton,	1007
	Dr Keiller, 21 Queen Street,	1845
	Dr A. J. Keiller, 21 Queen Street,	1889
130	Dr Skene Keith, 42 Charles Street, Berkeley Square, London,	
	W.,	1885
	Dr Thomas Keith, 42 Charles Street, Berkeley Square,	
	London, W.,	1852
	Dr C Kennedy 25 Newington Road	1886
	Dr George Kerr 6 St Colme Street	1885
	Dr George Kerr, o St Conne Street,	1000
195	Dr. W. Coatt Lang, 11 Merville Street,	1009
135	Dr W. Scott Lang, Edinburgh,	1886
	Dr Robert Lawson, 24 Mayheld Terrace,	1881
	Dr R. F. C. Leith, 129 Warrender Park Road,	1886
	Dr George Leslie, Falkirk,	1881
	Dr Linton, 60 George Square,	1863
140	Dr Littlejohn, 24 Royal Circus,	1853
	Dr. Harvey Littleighn 24 Royal Circus	1889

		Date of
	Dy Lyong Dollarith	Admission.
	Dr Lucas, Dalkelth,	1883
	Dr D. D. MiBuido 16 Choston Streat	1870
145	Dr F. M'Callum 3 Braudon Street	1885
140	Dr W Burn Macdonald Port Lodge Dunhar	1888
	Dr. J. M'Fadvean 9 East Hermitage Place Leith.	1888
	John M'Gibbon, Esq., 55 Queen Street.	1868
	Dr MacGillivray, 11 Rutland Street.	1877
150	Dr G. Mackay, 24 Gilmore Place.	1878
	Dr George Mackay, 2 Randolph Place,	1887
	Dr G. H. Mackay, Elgin,	1885
	Professor Sir Douglas Maclagan, 28 Heriot Row,	1834
	Dr J. S. M'Laren, 14 Walker Street,	1887
155	Dr P. H. Maclaren, 1 Drumsheugh Gardens,	1868
	Dr Roderick M'Laren, 23 Portland Square, Carlisle, .	1882
	Dr J. W. Martin, Gie Appantoo, Axim, Gold Coast, Africa,	1888
	Dr A. Matthew, Corstorphine,	1882
	Dr D. Menzies, 20 Rutlaud Square,	1878
160	Dr W. Menzies, 115 Lothian Road,	1847
	Dr J. C. Messer, 15 Belgrave Place,	1887
	Dr J. Mill, 178 Ferry Road, .	1886
	A. G. Miller, Esq., 7 Coates Crescent, Vice-President, .	1867
	Dr D. Milligan, 11 Palmerston Place,	1885
165	Sir Arthur Mitchell, 34 Drummond Place,	1859
	Dr Moir, 52 Castle Street,	1836
	Dr Alexander Moir, 30 Bucciench Place,	1870
	Dr Albert Edward Morison, Hartlepool,	1889
	Dr J. Rutherford Morison, 14 Savine Row, Newcastle-on-	1800
170	Dr John Mowet 1 Hone Park Terrage	1985
110	Dr Cland Muirhead 30 Charlotte Sanare	1866
	Dr B. Milne Murray 10 Hone Street	1884
	Dr A. D. Leith Nanier, 67 Grosvenor Street, Grosvenor Square,	1001
	London, W.,	1879
	Dr T. Goodall Nasmyth, Cowdenbeath, Fife.	1884
175	Dr E. F. Neve, Dispensary, Srinagar, Kashmir, N.W.	
	India.	1884
	Dr H. Newcombe, 5 Dalrymple Crescent,	1883
	Dr P. Orphoot, 113 George Street,	1865
	Dr T. W. Pairman, Te Awamutu, Waipa, Auckland, N.Z.,	1884
	Dr Paterson, 4 Coates Crescent,	1847
180	Dr G. Keppie Paterson, 17 Forth Street,	1889
	Dr D. Noël Paton, 4 Walker Street,	1885
	Dr Peddie, 15 Rutland Street, .	1842
	Dr J. A. Philip, Rue Victor Hugo, Boulogne-Sur-Mer,	1878
	Dr R. W. Philip, 4 Melville Crescent,	1883
185	Dr Playfair, 5 Melville Crescent,	1874
	Dr Edmund Price, 28 Mayneid Road,	1889
	Dr J. H. Pringle, 5 Livingstone Place,	1880
	Dr T. Proudioot, 15 Lauriston riace,	1995
100	Dr S. nale Fuckle, Dishop Castle, Shiopshile,	1874
190	Dr William Richardson Bath Lodge Reading	1884
	Dr James Ritchie 14 Charlotte Souare Secretary	1873
	Dr P. Peel Ritchie 1 Melville Crescent	1862
	Dr Argyll Robertson, 18 Charlotte Square,	1861
195	Dr Ronaldson, 3 Bruntsfield Terrace.	1877
200	Dr J. Maxwell Ross, 112 Gilmore Place,	1882
	Dr Joseph C. Ross, 98 Mosley Street, Manchester,	1884
	Dr Home Ross, 40 York Place,	1888
	Dr S. Rumboll, Belgaum House, Woodhouse Lane,	1887
200	Thomas Russell, Esq., Davidson's Mains,	1888

		Admission.
	Dr William Russell, 46 Albany Street,	1884
	Professor Rutherford, 14 Douglas Crescent,	1866
	Dr F. A. Saunders, Denburn, Crail,	1884
	Dr Thomas R. Scott, Musselburgh,	1884
205	Dr Andrew Semple, 10 Forres Street,	1883
	Dr John Shand, 34 Albany Street,	1878
	C. H. E. Sheaf, Esq., Toowoomba, Queensland, Australia,	1871
	Dr G. F. Shiels, 229 Geary Street, San Francisco,	1887
~ * *	Dr W. H. Shirreff, Melbourne, Australia,	1883
210	Dr J. Sibbald, 3 St Margaret's Road,	1859
	Professor Simpson, 52 Queen Street, President,	1859
	Dr A. T. Sloan, 22 Forth Street,	1885
	Dr Andrew Smart, 20 Charlotte Square,	1865
	Dr G. D. Smith, 146 Ferry Road,	1877
215	Dr John Smith, 11 Wemyss Place,	1856
	Dr John Smith, Brycehall, Kirkcaldy,	1889
	Professor Grainger Stewart, 19 Charlotte Square,	1861
	Dr J. S. Stewart, 16 Merchiston Terrace,	1885
000	Dr W. Stewart, Kirkwall,	1879
220	Dr William Stewart, 105 Ferry Road, Leith,	1889
	Dr H. J. Stiles, 5 Castle Terrace,	1889
	Dr John Strachan, Dollar,	1867
	Dr James Struthers, 39 Charlotte Street, Leith,	1849
005	Dr J. F. Sturrock, Homewood, Broughty Ferry,	1887
225	Dr Allan C. Sym, 144 Morningside Road,	1889
	Dr William G. Sym, 58 Queen Street,	1889
	Dr W Taylon 12 Melville Street	1878
	Dr W. Taylor, 12 Melvine Street,	1871
920	Dr C. H. Theteher, 19 Alberry Struct	1887
200	Dr O. H. Thatcher, 15 Albany Street,	1876
	Dr Alexia Thomas 2 Costos Cressont	1084
	Dr John Thomson, 11 Costos Crescent,	1887
	Dr I Stitt Thomson Dalkeith	1007
235	Dr Francis Troup 1 Minto Street Treasurer	1077
200	Dr Batty Tuke 20 Charlotte Square	1964
	Dr.J. Batty Tuke ir. Balgreen Murrayfield	1886
	Dr Dawson F. D. Turner, 7 George Square.	1890
	Professor Sir William Turner, 6 Eton Terrace.	1858
240	Dr R. S. Turner, Keith.	1867
	Dr Underhill, 8 Coates Crescent,	1872
	Dr T. Edgar Underhill, Broomsgrove, Worcestershire,	1885
	Dr D. Wallace, 66 Northumberland Street.	1887
	Dr P. H. Watson, 16 Charlotte Square,	1856
245	Dr W. Watson, Midcalder,	1862
	Dr A. D. Webster, 20 Newington Road,	1883
	Dr A. B. Whitton, Aberchirder,	1886
	Dr J. Lockhart Wilson, Duns,	1888
	J. L. Wilson, Esq., 4 Buccleuch Place,	1883
250	Dr T. D. Wilson, 10 Newington Road,	1880
	Dr Oswald G. Wood, India,	1886
	Dr Russell E. Wood, 9 Darnaway Street,	1883
	Dr G. Sims Woodhead, Beverley, Nightingale Lane, Balham,	
	London,	1883
	Dr Strethill Wright, 8 St Aidan's Terrace, Claughton, Birken-	
	head,	1871
255	Dr Hamilton Wylie, 1 George Place,	1883
	Dr John Wyllie, 1 Melville Street,	1868
	Dr James Young, 14 Ainslie Place,	1859
	Dr P. A. Young, 25 Manor Place,	1870
	Dr Ziegler, 47 George Square,	1876

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xxii ALPHABETICAL LIST OF MEMBERS OF THE SOCIETY.

	NON-RESIDENT.	Date of Admission
260	Dr J. J. Bailey, Marple, Cheshire,	. 1874
	Dr F. W. Barry, London,	. 1878
	Dr Bethune, Toronto,	. 1861
	Dr J. S. Beveridge, Edenbridge,	. 1861
	Dr J. W. Black, London,	. 1865
265	Dr Brodie, Canterbury,	. 1865
	Dr John Brown, Burnley,	. 1878
	Professor Cleland, Glasgow,	. 1864
	Dr Coghill, Ventnor.	. 1870
	Dr P. M. Deas, Excter,	. 1868
270	Dr J. W. Eastwood, Darlington,	. 1871
	Dr R. B. Finlay, O.C., M.P., Middle Temple, London,	. 1864
	Dr Foulis. Cuvar-Fife,	. 1859
	Professor Gamgee, St-Leonards-on-Sea,	. 1863
	Peter Gordon, Esg., Juniper Green,	. 1861
275	Dr Groesbeck, Cincinnati,	. 1875
	Dr Archibald Hall, Montreal,	. 1853
	Professor D. J. Hamilton, Aberdeen University,	. 1876
	Dr J. H. Hay, Alloa,	. 1880
	Dr Stanley Havnes, Malvern,	. 1864
280	Dr J. S. Howden, Montrose,	. 1856
	Dr James Johnston, London,	. 1871
	Dr George Keith, Currie,	. 1845
	Dr Lowe, Wimbledon.	. 1845
	Dr F. R. Macdonald, Inveraray,	. 1860
285	Dr K. N. Macdonald, Bridge of Allan,	. 1880
	Dr John A. Macdougall. Carlisle.	. 1875
	Dr John Mackay, Aberfeldy,	. 1881
	Professor M'Kendrick, Glasgow,	. 1870
	Dr W. O. Mackenzie, D. I. G. H., London,	. 1845
290	Dr T. J. Maclagan, London,	. 1875
	Dr J. Moolman, Cape of Good Hope,	. 1877
	Dr J. Ivor Murray, Scarboro',	. 1857
	Dr Andrew Myrtle, Harrogate,	. 1859
	Professor Bell Pettigrew, St Andrews.	. 1873
295	Dr Phillippo, Kingston, Jamaica,	. 1860
	Professor W. S. Plavfair, London,	. 1857
	Dr Priestley, London,	. 1854
	Thomas Sheriff, Esg., Edinburgh,	. 1867
	Dr Sinclair, London,	. 1850
300	Dr Francis Skae, Lerwick,	. 1864
	Dr T. Skinner, London,	. 1856
	Dr Van Someren, Redhill, Surrey,	. 1845
	Dr Somerville, Galashiels,	. 1877
	Dr Graham Steell, Manchester,	. 1877
305	Professor Stephenson, Aberdeen,	. 1861
	Dr H. R. Storer, Newport, Rhode Island, U.S.,	. 1855
	Professor Lawson Tait, LL.D., Birmingham, .	. 1870
	Dr Thin, London,	. 1861
	Dr Turnour, Denbigh, .	. 1843
310	Dr Walter Weir, London,	. 1879
	Dr Yellowlees, Gartnavel Asylum, Glasgow,	. 1862
312	Professor John Young, Glasgow,	. 1860

N.B.—Members are requested to communicate with the Secretaries if they discover any errors or omissions in the List, and also to intimate all changes in their addresses.

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OF

THE MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH,

FOR SESSION LXIX., 1889-90.

Meeting I.-November 6, 1889.

Dr JOHN SMITH, President, in the Chair.

I. ELECTION OF OFFICE-BEARERS.

The following gentlemen were elected office-bearers for the ensuing session :—*President*, Professor Alexander R. Simpson; *Vice-Presidents*, Dr Clouston, Mr A. G. Miller, Dr Brakenridge; *Councillors*, Dr Ireland, Dr Matthew, Dr A. H. F. Barbour, Mr Charles W. Cathcart, Dr John Smith, Dr Strachan, Dr Alex. Bruce, Dr G. Sims Woodhead; *Treasurer*, Dr Francis Troup, 1 Minto Street; *Secretaries*, Dr James Ritchie, 14 Charlotte Square, and Mr F. M. Caird, 21 Rutland Street; *Editor of Transactions*, Dr William Craig, 7 Bruntsfield Place.

II. EXHIBITION OF PATIENTS.

1. Dr Felkin showed a case illustrating some points of interest in the PATHOLOGY AND SURGERY OF CORTICAL LESIONS OF THE BRAIN. The patient was first shown to the Society on February 15th, 1888. The results of the trephining which had been performed by Professor Hare had been very successful in many ways, although not quite to the extent which was at first hoped. The patient's right arm had grown $2\frac{1}{2}$ inches since the operation, the left arm $\frac{1}{4}$ inch. The right leg had grown an inch, the left $\frac{1}{4}$ inch, and the size of the right arm had increased and its movements had greatly improved. The patient was now able to flex and extend the forearm with ease; she was almost able to touch the tip of her shoulder with ease, and she could put the hand behind her head. Supination was still very faulty, however, and the movements of the thumb very weak. At the knee, flexion and extension were now perfectly performed, flexion and extension of the foot were improved, but eversion and inversion of the foot showed only slight improvement. The patient was far brighter and more intelligent than she was before the operation. The dizziness and headaches from which she complained had entirely disappeared, sensation in the right arm and leg were almost equal to that in the left, and the spinal curvature from which she suffered was less than it was. The patient was now a useful member of society; she was able to walk 5 or 6 miles without fatigue; she could dress and undress herself; she worked a sewing machine; she had sole charge of her young brothers and sisters, and did all the cooking and most of the cleaning in her home. The treatment adopted since the operation, and continued for 14 months, was either the application of the faradic current or massage applied to the arm and leg daily.¹

2. Prof. Grainger Stewart exhibited to the Society FIVE CASES OF NERVOUS DISEASE at present undergoing in his wards treatment by suspension, and pointed out in detail the results obtained in each case.

The first case (R. V.) was one of locomotor ataxia, with some spastic symptoms of eight years' duration, in whom, after 29 suspensions, marked benefit had accrued. The lightning pains, girdle pain, and the Romberg symptom had disappeared; his gait had markedly improved; the numbness in the soles of the feet had considerably diminished, and certain gastric symptoms, allied to gastric crises, had been very much relieved. The spasmodic jerkings of the limbs, formerly very marked, occurred now but seldom. Sexual desire and power, greatly affected in the course of his illness, had already been largely recovered. In addition to these specific results, the patient distinctly asserted that his general condition was much better since the treatment was begun.

Case No. 2 (W. N.)—one of pure locomotor ataxia—was next shown. In this patient also the lightning pains had passed off; the girdle pain, however, had been but little altered. His gait had improved greatly, and he could now stand much more steadily with the eyes shut than he could formerly do. Diplopia was now a comparatively rare experience for him, and a troublesome and persistent lachrymation had been relieved. The numbness of the feet and loss of patellar reflex were unaltered, but some bladder symptoms had been improved, and the sexual power seemed to be

¹ For a full report of the case, see Medical Chronicle, October 1889.

in some measure regained. This patient also very decidedly expressed himself as much improved in general condition after his 21 suspensions.

The third case referred to was one of pure spastic paralysis. After 20 suspensions the patient stated that whereas he used "only to be able to walk a mile with difficulty," he "can now walk six with comfort." The jerkings of the limbs when tired—the spinal epilepsy so called—had almost disappeared.

The next two cases had only had four suspensions each.

The fourth case (W. R.) had been suffering from ataxic symptoms for about 4 months. In him the Romberg symptom was well marked on admission; it had now completely gone. His gait had very greatly improved, and the giddiness and headache he used to complain much of had also been decidedly benefited. This patient was emphatic in his testimony to the benefit he had received.

Case No. 5 (G. S.)—one of spastic paralysis—had also been only a brief period under observation. His gait was very typical of the advanced disease, but had improved to some extent already. On admission he could only walk with the aid of sticks; now he was able to walk the length of the ward without support.

The method of carrying out the suspension was then demonstrated to the Society on this patient. Prof. Grainger Stewart pointed out that the treatment was begun with a suspension of 10 seconds, and repeated every second day, the time being increased by 10 seconds on each occasion. As yet he had seen no bad results from it, and his general impression of the treatment so far was distinctly favourable.

3. Dr Byrom Bramwell showed a patient who was suffering from COMPLETE PARALYSIS OF THE WHOLE OF THE MUSCLES, and ALMOST COMPLETE ANÆSTHESIA, OF THE RIGHT UPPER EXTREMITY. The condition had resulted from a fall received six months previously, and appeared to be due to a rupture of the brachial plexus.

III. EXHIBITION OF SPECIMENS.

1. Dr Byrom Bramwell showed the BRAIN from a case of so-called PERFORATING TUMOUR OF THE SKULL—also Photographs of the patient and of the specimen. The new growth appeared to have originated either in the bone or periosteum. On microscopical examination it was found to be a small round-celled sarcoma. The usual subjective symptoms of intra-cranial tumour (headache, vomiting, etc.) were absent; double optic neuritis was well marked.

2. Dr James Carmichael exhibited samples of the GLYCERITES of the IODIDE OF IRON, OF IRON, LIME, POTASH, AND SODA, of the HYPOPHOSPHITE OF LIME, PHOSPHATES OF QUININE, IRON, AND

STRYCHNINE, HYPOPHOSPHITE OF ZINC, LACTOPHOSPHATE OF IRON, LACTOPHOSPHATE OF LIME, HYPOPHOSPHITE OF SODA, PROTOCHLORIDE OF IRON, and PHOSPHATE OF IRON. These drugs had been specially prepared by Messrs Duncan, Flockhart, & Co. He remarked that in the British Pharmacopœia of 1867 these preparations had first been introduced as glycerina. In the U.S. Pharmacopœia of 1870 the same preparations, with some additional ones, were termed glycerates. French pharmacologists at the same time. termed them glyceroles-a name which is apt to mislead, as the terminal is one generally used to denote proximate organic principles, such, for example, as benzol. The term glycerinum hardly appears to be satisfactory, as implying a definite relationship, which does not exist, in the antecedent word to that which follows. The term glycerite, therefore, has been adopted for some years in America, and is now coming into general use here. He believed these preparations presented many advantages over the similar ones made with syrup. They appeared to be more stable and more digestible. and the drugs much more active than when combined with syrup. At the suggestion of his resident physician, Dr Lockhart Gillespie, he had been making an extended trial of the glycerites now exhibited, with satisfactory results, in the Royal Hospital for Sick Children as well as in private practice. Some of the preparations had also been used in the Royal Infirmary, where they had been introduced and prepared by the able pharmaceutist to that Institution, Mr Charles Arthur, who also had read a paper last April at the Pharmaceutical Society on Glycerites of the Ferrous Salts, in which he expressed an opinion that the glycerine combination was preferable to the syrupy one, as adding greater stability to the preparations, especially of the ferrous salts. His object in showing these preparations to the Society was to induce the profession to give them a more extended trial than had yet been done. He thought them elegant and useful, and they were quite as cheap as the syrupy preparations.

3. Dr Shaw M Laren showed a specimen of CONGENITAL ABSENCE OF THE TIBLA, taken from a male child about two years old. The deformed limb was the right one. As Dr Heron Watson considered the leg useless, he had amputated it above the knee-joint. Fourteen cases have been recorded; of these only seven were cases of complete absence, the upper end of the tibia being present in the remainder. The tibia in this case was represented by a membranous band; in a case recorded by Ehrlich by a remarkable cone of bone projecting at right angles to the lower end of the femur; and in a case of Billroth's by a small process from the patella. The patella was absent in two cases. The tendons from the deep flexors at the back of the leg had united with that from the tibialis anticus and with the accessorius to form a curious tendinous web under the sole, which then gave off the tendons to the digits. The
same thing occurred in a case shown by Dr Craig some years ago. Dr M'Laren suggested that, as this common tendon was attached to the under surface of the tarsus, it might be regarded as replacing the fixed point usually supplied by the lower end of the tibia round which the tendons played. Two fine drawings by Dr John Thomson were exhibited, and a cast of the limb before dissection showed the condition of extreme talipes equino-varus.

4. Dr John Thomson showed a CAST OF CONGENITAL ABSENCE OF RADIUS. The cast and photograph were taken from the left arm of a girl aged 20, and showed the deformity resulting from congenital absence of the greater part of the radius. The right upper extremity was normal and well formed in every respect. On the affected side, the scapula, clavicle, and upper part of the humerus seemed normal. The lower end of the humerus was about half an inch smaller in transverse diameter than the same part on the right side. The ulna was only about 6 inches long, and very much curved from the action of the muscles, its lower end being somewhat thickened as compared with that on the right arm. The radius was almost entirely absent, being only represented by a small piece of bone about an inch long, and a good deal smaller in diameter than the normal articular end of that bone. It was closely attached to the carpus, between which and it there was not very extensive movement. Its upper end appeared to be connected with the ulna by fibrous attachments. No abnormality could be felt in the carpus. The four inner digits and their corresponding metacarpal bones seemed normal, although smaller than those of the right hand. The distal phalanx of the thumb was tolerably well formed, the proximal phalanx less than half the normal length, and its metacarpal bone rudimentary-being about two-thirds of an inch long, ending abruptly in a point, and not articulating with the carpus at all. The movements at the elbow were limited in extent and feeble. Those of the hand were mainly of the nature of pronation and supination. There seemed almost no movement between the radius and carpus—the rudimentary radius being like an extra carpal bone and moving in a piece with the others. There was no proper flexion and extension at the wrist-joint. The fingers could be flexed and extended, but not completely. The thumb was entirely destitute of muscular attachment. The patient was suffering from phthisis, and presented no other abnormality. She was an only child, her father and mother were healthy, and there was no history to be obtained of any malformation in the family on either side. mother did not suffer from any injury or shock during her pregnancy, and was not the subject of any "maternal impressions."

IV. VALEDICTORY ADDRESS.

By JOHN SMITH, M.D., LL.D., F.R.C.S. Ed.

IN relinquishing the duties of the chair this evening, I have to express the interest and pleasure with which I have presided at these meetings and listened to the communications and debates of the Society during my term of office as your President for the last two years. And while I thanked you at the commencement of my career for the honour you then conferred upon me in my election to that distinguished position, I have now at its close once more to thank you for the uniform courtesy and support afforded me on every occasion of our meeting; while in your name—in other words, in the name of the Medico-Chirurgical Society—as well as for myself individually, I have to thank the Secretaries and Council, not forgetting the Editor of our *Transactions*, for their able assistance, their kind interest, and unsparing efforts in promoting its welfare and its advancement in every possible way.

There is a custom well known to you all as a ceremony of the most remote antiquity-I mean that of the Harvest Home. This old festival was, as it now is, the natural outcome of a satisfactory conclusion to a period of useful and beneficial work and care; and viewed in such a manner, there is between the valedictory meeting of a society of this kind and the closing Autumn's Harvest Home no inconsiderable analogy. For if at the celebration of that festivity its proceedings were but the reflex of inward joy at what had been accomplished, something of the same kind can scarcely fail to be here produced, on the past showing a most satisfactory accomplishment of much useful work, and the immediate future presenting, if not to you, at least to your retiring President, a temporary cessation of much admittedly most pleasurable work, but also of some considerable care and anxiety. To you, indeed, not so much a cessation as the introduction of a refreshing variety in your work, for it may be said that-

> "With to-morrow's sun Your annual toil begins again, the never ceasing round."

Let us look, then, and see what has been the work of the last two sessions. Well, it would demand much more time than can be here afforded even to recapitulate adequately all that during that time has been done. Some matters which have been discussed bulk much more largely in value and importance than others. There have been occasions when the subject of communication or debate has taken more possession of us and lingered longest in our mind, and which candidly we would rather not have lost, than any of the others; but while certain contributions, whether in the form of papers read, or patients introduced, or morbid specimens exhibited, may thus present themselves more prominently for remark, not the smallest donation of the kind made at these meetings has been without its value, whether in point of interest or instruction, in furthering the advancement of Medicine and Surgery. It is impossible, however, even if it were called for, that I should review, or even mention, each and every one which has been thus communicated or exhibited at the Medico-Chirurgical Society, and commanded its attention and deliberation, since I had the honour of assuming the duties of the chair in November 1887, so I shall not attempt it.

At that meeting the retiring President, Professor Grainger Stewart, delivered to you his valedictory address, which I need not remind you was full of useful suggestions on medical teaching and legislation, and in which he ably contrasted the medical aspects of 25 years ago with the present time,-showing the immense strides the profession had made during that period in every department. About this time, also, the subject which had been most recently engrossing, perhaps, the largest amount of the Society's consideration and investigation was still sub judice, namely, the nature of the contagium of Scarlet Fever; and two reports in reference to this inquiry had been submitted in accordance with the instructions of the meeting of the previous June, and a special meeting was held for the discussion of the subject on the 20th July. Interesting and valuable, however, as these reports were, and able and instructive as were the remarks which followed upon their reading, much more was felt to be necessary towards fully and satisfactorily elucidating many points involved in the etiology and treatment of this disease; but the somewhat gigantic aspect it thus assumed, compared with the modest resources of the Society, led to the subject being numbered, to a large extent, with the many other "Enterprises of great pith and moment" which with "This regard their currents turn awry and lose the name of action." Nevertheless a certain impetus would seem to have been given to such inquiries; the line of thought seemed, as it were, fairly started, and soon to be directed in a large measure to certain cognate subjects, to which I shall in due course have to refer.

At this meeting also—upon which Professor Grainger Stewart resigned the chair to his successor—an interesting paper was read by Dr Cathcart, the subject being, "Should Partial Foot Amputations be Abandoned?" The general question in this communication, it will be remembered, seemed to be whether under the aspects of modern surgery not so much weight need be attached to the axiom that the danger of amputation was proportionate to its nearness to the trunk, and if so, that any advantage in removing a larger portion of the foot should not be lost sight of on this account; artificial limb makers being inclined in many cases to approve of those amputations, such as Syme's, which enabled them to make a neater substitute. The "Etiology of

Tumours" furnished at an early period of the session an interesting discussion opened by Dr Bruce in the absence of Dr Woodhead, and in which many scientific and not a few practical views were advanced by the physiologists and surgeons present upon that occasion. An important and interesting paper by Dr Symington "On the Shape and Position of the Liver" will not easily be forgotten by such members as enjoyed the advantage of hearing it read ; while those of Dr Skene Keith "On Treatment of Fibroid Tumours of the Uterus by Electricity," of Dr Hunter of Linlithgow "On the Place of Specialism in General Practice," of Dr M'Bride on the "Diagnosis of Maxillary Empyema as a Symptom in Ozæna," and of Professor Annandale on the "Surgery of the Male Bladder," led up to the deeply interesting, exhaustive, and important dissertation by Principal Walley upon "Animal Tuberculosis in Relation to Consumption in Man." Following upon the reading of this communication, the Society considered that it was desirable to address the Secretary for Scotland and also the Lord President of the Privy Council upon the subject, which, after several meetings of Council and the appointment of a sub-committee, was done, with the result of a request by the Secretary for Scotland being addressed to the Society, desiring that two of its members should be sent as delegates to London, to give evidence before the Committee of the Privy Council on Bovine Tuberculosis. Drs Littlejohn and Peel Ritchie were accordingly appointed to discharge this duty and report, which was duly and efficiently performed, and a cordial vote of thanks by the Society formally accorded these gentlemen. It was in regard to this paper of Principal Walley's that the investigation into the nature of contagion was again very generally revived, and with somewhat more practical results than the previous deliberations on that of scarlet fever,-since it is not too much to believe that the manner in which the Society submitted its views in the memorials and evidence alluded to, not only to the National Legislature, but to the municipal authorities of Edinburgh and other towns, served to lend an impetus to those inquiries and regulations which are at the present time being carried out at head-quarters on this very serious subject. An able and exhaustive communication "On the Clinical Value of Temperature Observations in some Acute and Chronic Diseases" by Dr J. O. Affleck, followed by a long and interesting discussion; a paper on "Nephrotomy" by Dr Miller, and another on "Respiratory Neurosis" by Dr Smart, were the next communications; while those of Dr Dods on "Tropical Malaria," of Dr Troup on the "Microscopic Diagnosis of Phthisis," followed by a long discussion on the Bacillus of Tubercle; of Dr Cotterill on "An Epidemic of Sore Throat in Relation to Milk Supply," of Dr M'Bride on "The Removal of Nasal Polypi," and of Dr Thom of Crieff on "Tracheotomy in Children," brought the session of 1887-88 to a close.

The papers of the next session commenced with that of Dr Cotterill upon "A Case of Cure by Resection of Intestine of Fæcal Fistula following extensive Gangrene of the Transverse Colon." Members will recollect the description given of this remarkable and successful operation, and that Dr Cotterill had shown among the morbid specimens exhibited at the previous June meeting the piece of large intestine removed, and which measured fifteen inches long. "The Treatment of Diphtheria in Children by Antiseptic Steam," by Dr Wyld Pairman; "Clinical Notes on Laryngeal Tumours," by Dr M'Bride; "A Case of Elephantiasis," by Dr Felkin; "The Removal of Naso-Pharyngeal Tumours," by Professor Annandale; "Tuberculosis of the Bladder in a Case of Phthisis," by Dr Philip; a further communication on "Sites for Amputation in the Lower Limb in Relation to Artificial Substitutes," by Dr Cathcart; and "Acute Intussusception in a Child cured by Operation," by Professor Annandale, brought the session on to February, on the 20th of which month a special meeting of the Society took place, largely attended by both the medical and legal professions, when a discussion was opened and carried on at great length upon the important question of "The Necessity for further Legislation in the case of Habitual Drunkards." Like the discussion on Bovine Tuberculosis, the proceedings of this evening attracted much general interest to the subject, and appears to have been in many ways of material service in advancing the prospects of those measures for the establishment of what have been designated "Restorative Homes," and such a Bill as that drawn up with this object in view by Mr Charles Morton, the late crown agent, which was favourably commented upon at this meeting. Dr Foulis' communication on "Raising the Tongue and Epiglottis and Stretching the Aryteno-Epiglottic Folds at one and the same time" was read at the first March meeting, while at the second a long and instructive debate was held on the "Pathology and Treatment of Strumous Glands," in which most of our leading surgical teachers and practitioners took part. An interesting paper was read in May by Dr James on "The Pathological Physiology of Pleurisy and Pleuritic Effusion," and during the same month Professor Chiene communicated a paper on "Hospital Experiences," while Dr Miller delivered one on "Improvements in the Operation of Excision of the Knee for Strumous Disease." Two papers were communicated in June, one on "Cheyne-Stokes Respiration" by Dr Gibson, and another on the "Surgical Treatment of Empyema" by Dr Morison, and on the 19th of the month another largely attended special meeting was devoted to a "Discussion on Intestinal Obstruction, its Pathology and Treatment, Medical and Surgical," while the last contribution of the session was that of Dr Berry Hart upon the "Minute Anatomy of the Placenta in Extra-uterine Gestation."

In summarizing the work thus done I have restricted myself to

the papers read at these meetings. But in addition to these there must be kept in mind that at every meeting, except those of a special nature, a wealth of interest and instruction was to be found in the exhibition of patients and pathological specimens, instruments and apparatus, too numerous, as I have already said, to be here dealt with beyond their mere mention.

With such a harvest, then, thus gathered in, is it surprising that the Society should, at the occasion on which we now meet, congratulate itself on what it has achieved? In what other way could the same amount and variety of information have been so pleasantly overtaken or so effectually disseminated? Over and above the ordinary modern facilities for the publication of original work, such meetings as these are an advantage of incomparable magnitude in many respects. Nothing is more common in scientific research than that men in elaborating some work of inference or discovery do so with a bias or leaning towards their own persuasions or prejudices. The hunt after arguments supporting one side of the question unconsciously hoodwinks the mind in many an instance to the fallacies and errors of its reasoning, and leads to the mistaken conviction that it has formed the only right conception of the truth. In such a case discussion or debate before a society of this nature seldom fails, not only in dispelling error, but in evolving some fresh and additional ideas, and in throwing a new and increased light upon the views and conclusions of the inquirer. While even as a direct source of knowledge and information, not to speak of mental training, such meetings are of no small value to those who might otherwise be restricted to the silent teaching of their book-shelves, accepting and espousing as gospel the opinions and assertions found there without troubling themselves about either their establishment or confutation. Here, on the other hand, we stand face to face not only with much excellent work done, and with the knowledge and experience it has furnished, but we have an opportunity of discussing or hearing discussed, in presence of and with the author-the workman-himself, the ideas and the statements, and the facts he has promulgated, and judging for ourselves of their exactness or stability as scientific truths.

And there is something more than this; apart from the benefits and information thus disseminated exclusively among the members of such a Society, apart from the credit and reputation which may in many cases deservedly attach to the communications read, the opinions and conclusions and recommendations of a representative body of this kind, when it is considered expedient that they should be issued and made public, ought to be, and are, as we have seen, of a weight to command attention, not only in all matters of professional, but in many of general importance. For it is as much, and even more, the business of the Society to raise the standard of knowledge among the many than to advance the reputation of the few. Our older members who have already made their mark should not forget this, and might perhaps be induced to lend us a little oftener the light of their countenance as well as the benefit of their experience in many matters where experience alone constitutes, as it sometimes does, the main thing needful. It is, no doubt, during the earlier years of professional life that the latent energies rejoice most to manifest themselves, and that the greater portion of such work as that of the Medico-Chirurgical Society is accomplished. To a certain extent this is only reasonable and what might be expected; but the fact still remains, that in all probability much that would be valuable and interesting and instructive at our debates is lost by the absence of those who, presumably content with having already in the past contributed their fair proportion of such work, naturally hesitate,

> "When comes still evening on, and twilight gray Has in her sober livery all things clad,"

to leave their comfortable hearth and face the wintry blast, and who therefore, it may be supposed, adopt something like the sentiments of the husbandman of old, saying, "Thou hast already done due service; thy barns are full, and there is much good now laid up in store for thee; take thine ease therefore, eat, drink, and be merry."

From year to year, moreover, we miss the presence and assistance, and have to lament the loss by death of many valuable and distinguished members-many whose places are by no means easily filled up. During my own term of office there have to be recorded the deaths of one honorary member, the distinguished Professor Donders of Utrecht, and one foreign corresponding member, Prof. Breisky of Prague; of that veteran of the profession Dr Archibald Inglis, a man who during his long, honourable, and useful career filled many high positions, and among them the Vice-Presidency of our Society in 1859, and who, having been admitted so far back as 1827, for some years headed the list as senior member of the Society; while a much younger and deeply lamented death is fresh in the memory of us all, namely, that of Dr Alexander Sinclair, Fellow of the Royal College of Physicians, and a member of the Medico-Chirurgical Society since 1873. Two corresponding members within the United Kingdom have also to be added to the list, namely, Dr Robert Gordon Latham and Dr Charles J. B. Williams, both of London; two non-resident ordinary members, Dr John Traill of Arbroath, and Prof. F. S. B. de Chaumont of Netley; and three ordinary members not resident in Edinburgh, Dr Donald Mac-Raild, Greenock, Dr A. Murray Gibson, Portobello, and Dr Wm. M'Culloch Watson of Montrose, brother of the late Professor Morrison Watson.

And there is another and quite a different class of men whose absence we deplore—that is those who, oblivious of their own interests as well as of the intellectual pleasure afforded in such meetings as these, have never joined the Society at all. We can only hope and trust, however, that before long they also will see the advantage and the honour of having their names added to the illustrious array of those already gracing the list of membership since the day of its foundation.

These and other drawbacks and discouragements are common to every association of this nature; but although the Medico-Chirurgical Society has not, any more than other bodies of the kind, enjoyed an uninterrupted blaze of noonday sunshine, it has under all circumstances displayed an undaunted hope and indomitable perseverance which has met and surmounted many obstacles, and fully achieved—and I think the experience of the past two years warrants me in saying that it still continues fully to achieve-the objects of its wise and beneficent founders. The search for truth, not what any individual contributor may honestly suppose or merely wish to be the truth, is the essential purpose of our debates, and their influence and their success have always been established under the motto, "In certia unitas, in dubiis libertas, in omnibus caritas." In this way no inglorious service has been done by this, the leading association of our Faculty in the past, and the estimate to be formed from such a retrospect may, I trust, be but an incentive, a wholesome stimulus, and a foretaste of what we may yet expect to be attained by our Society in the future.

I have to apologize for the brief and imperfect manner in which I have ventured to uphold and maintain the influence for good which this body has exercised, and still deserves to exercise, in matters medical. I feel that I have treated the subject too briefly for its merits, although, perhaps, too amply for your patience. Experience, however, has taught me that I might rely on your indulgence in this, as I have often done in other circumstances previously; and I shall now—in relinquishing my duties here in favour of my distinguished successor, your President Elect, Professor Simpson—only add that, as I retire from this chair, the period of its occupancy by me, during the meetings of the last two years, is one which I shall ever look back upon as a bright and most pleasant experience in my professional life.

On the motion of *Prof. Grainger Stewart*, a cordial vote of thanks to the President for his interesting Address and his conduct in the Chair during his tenure of office was then passed.

Meeting II.-November 20, 1889.

Professor A. R. SIMPSON, President, in the Chair.

I. ELECTION OF NEW MEMBERS.

The following gentlemen were elected Ordinary Members of the Society:—A. Home Douglas, M.B., C.M., Ed., 6 Grosvenor Street; Alexander J. Keiller, L.R.C.P. & S. Ed., F.P. & S.G., 21 Queen Street; G. Keppie Paterson, M.B., C.M., Ed., 17 Forth Street; William Stewart, M.D., 105 Ferry Road, Leith.

II. EXHIBITION OF PATIENT.

Dr John Thomson showed a little girl, aged four, with a rounded patch of FAVUS about an inch in diameter on the outer surface of the left upper arm. There had been no favus on the scalp or elsewhere. The other members of the family, including the cat, were free from the disease. The disease began about three weeks ago, and now presented the usual appearance of favus on the body.

III. EXHIBITION OF SPECIMENS.

1. Dr Kennedy showed FOUR SMALL CALCAREOUS PLATES, which had been passed by a boy, 11 years old, early in October. The boy had been in good health till the day the concretions were passed, and since then there had been no bad symptoms. On that day he went to school rather out of sorts, and suffered so much from colic that about 11 A.M. he was sent home. On the way home the bowels were moved involuntarily, and in the cleaning process which followed these plates were found embedded in fæces. They were all about the same size, $\frac{1}{2}$ inch broad and $\frac{3}{4}$ inch long. Three of them were about 1 inch in thickness, quite flat and almost smooth on one side, the other surface consisting of rounded elevations of all sizes, from that of a lentil downwards, with furrows between. On the fractured edge the stratified appearance common to concretions was seen, and converging lines passed from the furrows marking off indistinct wedge-shaped areas. The fourth plate was much thinner than the others, and the elevations on the one surface were almost microscopic, and stood boldly out from a general flat surface. Under the lens the general surface was rough, and sparkled at various points. The opposite surface, as in the other three concretions, was flat and smooth. It was much darker than the others, evidently containing a much smaller proportion of lime salts. The only chemical examination as yet made was the solution of a small piece in acetic acid, this taking place slowly with effervescence, the acid becoming brown and containing a few undissolved fragments. A few drops of the solution were then diluted with water, and when neutralized by liq. potassæ what

appeared to be phosphates were precipitated. The plates had evidently formed on some foreign body, and the thin plate probably indicated that the body had lain in one position for a long time, one surface not being so much exposed to the action of fluids as the others. The boy had swallowed a short stick of indiarubber sixteen months previously, on the four sides of which these plates might have formed, only they were a little too large without the assumption that the indiarubber had swollen. Water had very little effect on indiarubber, but it was difficult to estimate the possible effect of the prolonged action of intestinal secretions. To account for the lime salts it was pointed out that Edinburgh water was somewhat hard, but that in addition the family had spent two successive summers at a place where the water supplied was so hard, that for washing, etc., they had to resort to well water.

2. Dr Troup exhibited an INTESTINAL CONCRETION passed by a patient 30 years ago when oatmeal was more used as food than now. It was of an irregular oval shape, facetted, soft and velvety to the feel, and measured $1\frac{1}{2}$ inch in its longest diameter, and 5 inches in its greatest circumference. Its section showed the concentric arrangement of its constituent parts. It was formed by the felting together of the fibro-vascular tissue of the pericarp of the oat and mineral matters. A micro-photograph of a scraping of it was shown, in which the truncated and pointed fibres and spiral vessels of its vegetable constituents were well seen. Dr Troup also said that in meal mills, in the sieves which sifted the meal as it left the millstones, such concretions, not so firm nor concentrically arranged, were frequently formed by the rotatory motion of the sieves, and that the peristalsis of the intestines brought about a similar result in the human body.

3. Dr James Ritchie exhibited A LONG PALE HAIR which was tied in a loop round the cervix-penis, and the free end wound twice round it, causing balanitis, much swelling of the glans, and deep ulceration of the cervix. As the hair was pale it escaped observation for a considerable time, during which there was little improvement from treatment beyond what was produced by the removal of decomposing discharge. After removal of the ligature recovery was rapid.

IV. ORIGINAL COMMUNICATIONS.

1. ON THE CURE OF FACIAL NEURALGIA, ODONTALGIA, AND ALLIED NEUROSES.

By GEORGE LESLIE, M.B., F.R.S. Ed., Falkirk.

ON the 16th August 1889, I found that, by an operation of extreme simplicity, I was able to arrest a very severe attack of supra-orbital neuralgia, and in what seemed to be no more than the period of nerve transmission. The idea at once suggested itself, that if a neuralgia or other pathological condition of one branch of the fifth cranial nerve could be controlled so easily, it was almost certain that similar conditions of other branches of the fifth, and probably of other cranial nerves, might be successfully treated by the same means. I immediately began a research on this point, which has been carried on during the past three months, and of which I now beg to lay the results before you. They appear to be important, to show indeed, that many of the most distressing and acutely painful ailments to which we have been supposed to be heirs—such as neuralgic headache, faceache, toothache, earache, and allied complaints—are, in the great majority of cases, unnecessary, and that a beneficent Nature has provided for them, to the rich and poor alike, an effectual remedy.

For all the cases of this nature which have come under my care a uniform treatment has been followed. It has been the application of powdered chloride of sodium—common table salt—to the nasal mucous membrane. The salt may be used by the patient as snuff, a pinch being taken into the nostril of the affected side, and in many cases I have found this to be effectual in preventing recurrence, but the best results have been got when the salt has been applied by means of an insufflator. In practice I charge a small insufflator, the chamber of which contains about four grains, and ask the patient to draw air up the nostril while I inject the contents. It will be found that the application produces little pain or discomfort.

It is probable that other chemical substances, especially those allied in constitution to chloride of sodium, may produce similar therapeutic effects, but as I have not had a specially obstinate case in my own practice, I have not yet tried others, and have considered their discovery a matter more of scientific curiosity than of practical importance. The stimulation by chloride of sodium appears to induce in the nasal branches of the fifth nerve a form of nerve motion, which causes reflex inhibition of the pathological process in the nerves affected, inhibits the abnormal form of nerve energy, of which the expression is pain, and replaces it by the normal form, of which the expression is not pain.

The mode of disappearance of the neuralgia is noteworthy. So unattended is it by any form of shock or other unpleasantness, that though the patient may be suffering from intense pain one minute, and be absolutely free from it the next, it is generally somewhat longer before he can realize his altered condition, and he usually employs a short time in introspection before announcing the favourable result.

Although a single application usually suffices for the immediate inhibition of neuralgia, especially when it is recent and localized in one branch of the fifth nerve, in other cases, where the disease has been of long standing and of extensive distribution, I have found that insufflation repeated every half minute, for about five minutes, was required. It is as illogical to ascribe failure to this method of treatment because one application may not give immediate relief from any form of cranial neuralgia, as it would be to deny the anæsthetic properties of chloroform, when it was found that one act of inhalation of its vapour did not produce anæsthesia.

As to the results attained, I will first crave your consideration of the successful cases, not only as they are naturally regarded with most complaisance, but as they greatly exceed the others in number, and as their study may help us to understand the causes of failure in the others. During the past three months I have treated about forty cases of cranial neuralgias and allied diseases with complete success, two or three with partial success, and two with no effect. The limits of this paper will only allow me to give a selection from the first group of cases.

CASE I.—Supra-orbital Neuralgia.—Mrs R., æt. 59, consulted me on 16th August 1889. Stated that she suffered from intense pain in the left supra-orbital region and in the left orbit, with dimness of vision in the left eye. The affected area was tender to touch. The pain had been first felt a fortnight before, and had been intermittent, but during the previous night and morning it had been continuous. I applied chloride of sodium to the mucous membrane of the left nostril, with the result that the pain and tenderness disappeared instantly. The patient was much astonished at the sudden and complete transition from agony to comfort.

19th November 1889.—I have seen the patient to-day. There has been no recurrence of the neuralgia.

N.B.—There was no element of mystery in this case; the patient knew that it was table salt which I applied.

CASE II.—Supra-orbital Neuralgia.—Mr J. R., æt. 39, consulted me on 10th October 1889. Stated that he had suffered, generally for about ten days every year for the past five or six years, from severe neuralgia in the left supra-orbital region. He had derived little benefit from treatment, which had consisted of cupping and liniments externally, with internal administration of quinine, iron, etc. The pain had been first felt at 8.30 A.M., and by 9 A.M. it was very severe. I saw him about noon, when I insufflated powdered chloride of sodium into the left nostril, and got rapid and complete cessations of the neuralgia. My last note in this case is on the 2nd November, when there had been no recurrence.

CASE III.—Neuralgia of Right Temple.—Mr D. L., æt. 33, 13th October 1889, complained of severe pain in the right temple. Stated that for the last seven years he had suffered from neuralgic attacks in the same region, which had usually occurred weekly, and had sometimes lasted two days. Treatment as in Case II. The result was instant relief. 24th October.—The patient again called, the pain having returned, but in a modified degree. The result of treatment was as before.

The following may be regarded as typical cases of toothache which I have treated :---

CASE IV. — Odontalgia. — Mr J. A. had suffered from toothache, referred to second right upper molar, for about a fortnight. Had gone to Edinburgh, 2nd September 1889, to consult his dentist, who, at 2.30 P.M., stopped the affected tooth. The process of stopping gave rise to increased odontalgia, but he was assured that the pain would disappear in an hour or two. The patient returned to Falkirk at 4 P.M., but the odontalgia became excessive. Hot salt and other domestic remedies were applied with no beneficial effect. As the family knew that I did not profess any form of dentistry, I was not called until 10.30 P.M., when I found my friend and patient in excessive pain. The result of treatment was instant relief.

19th November 1889.—There has been no recurrence of the toothache.

CASE V. — Odontalgia. — Nurse A. M. consulted me on 3rd September. Stated that she had suffered from toothache, which I found was referred to the first left upper molar. When I saw her the pain was evidently very acute. After the sodic chloride treatment the pain disappeared in a few seconds.

CASE VI.—Odontalgia.—Master J. W., æt. 10, was brought to me on 21st September. Complained of severe pain, referred to the first right upper molar. The result of treatment was instant relief.

CASE VII.—Odontalgia.—Mr J. W., æt. 25, consulted me on 14th October. Complained of toothache in third right lower molar. Had been very severe for two days, and patient had slept little during the previous night, having been kept awake by the pain. With treatment he had instant relief.

CASE VIII.—*Odontalgia.*—J. H., æt. 21, governess, was brought to me on 4th November. Was suffering from excessive pain referred to the third lower left molar, which exhibited indication of caries. The result of treatment was complete relief in about 40 or 50 seconds.

I have details of many cases of odontalgia which I have treated by the same means, and with entirely successful results, but consider that their enumeration is not now necessary.

CASE IX.—Facial Neuralgia.—Mrs F., æt. 50, consulted me on 30th August. For several years she had suffered from severe facial neuralgia, for which she had used many remedies, but she had come to regard it as incurable. In this case not only was the pain so continuous and so intense in character that she rarely had many hours consecutive sleep, but the tenderness of the affected area was so excessive that the patient had great pain in using a sponge to the face or even in letting a veil rest on it. When I saw her she complained of great pain in the left temple, orbit, infraorbital, and maxillary regions. The result of the chloride of sodium treatment was almost instant disappearance of the neuralgia from the temple and the orbit, probably thirty seconds later from the infra-orbital region, and in about a minute more from the upper and lower maxillary regions. Not only did the pain disappear, but there was left absolutely no trace of the accompanying tenderness.

18th November.—The subsequent history of this case is exceedingly satisfactory. The neuralgia recurred in a modified degree, and only in the infra-orbital region, several times, but gave way at once to treatment. She is now practically free from neuralgia, and is in the enjoyment of ordinary health.

CASE X.—Facial Neuralgia.—Mrs J., æt. 69. This case was very similar to the above. The patient consulted me on 20th September, when she had the symptoms of an acute attack of neuralgia, involving all the branches of the fifth nerve of the left side. There was great tenderness on pressure over the affected area. With treatment there was relief in a few seconds, the pain disappearing first from the ophthalmic division of the nerve. I was assured, 18th November, by a member of this lady's family, that the relief had been permanent.

CASE XI.—Facial Neuralgia with Otalgia.—Mrs L., et. 25, consulted me on 5th November. Stated that she had suffered from facial neuralgia, at intervals, for the past six years. The pain was severe in the right temple orbit, anterior auricular and infra-orbital regions, and in both maxillæ. The patient had taken large doses of quinine, etc., but had experienced little benefit. With treatment there was relief in a few seconds. As in the other cases, where all the branches of the fifth nerve were involved, the pain disappeared from the first, second, and third divisions successively. Patient consulted me next day. Pain had recurred in the morning, and this time there was distinct otalgia—a frequent symptom, as I was informed, but which had not been present the previous night. There was again almost instantaneous relief. I then gave the patient directions for self-treatment.

19th November.—I have seen this patient to-day. The pain has recurred on several occasions, but it is not now regarded, as it is relieved immediately on its appearance. The patient says, "The toothache always goes away last."

The above may be accepted as typical, but I have notes of other cases of the same nature, and which have been treated with the same result.

I have treated, and have notes of a considerable number of severe

cases of neuralgic headaches, and have invariably favourable results. The following may be taken as examples :----

CASE XII.—Frontal Cephalalgia.—Mr J. M., æt. 29, consulted me on 11th October, complaining of above. The pain, which was described as "sickening," was of three weeks' duration, and during that period the patient had only been able to be at work for two days. The expression was dull, heavy, and pained; with treatment there was complete relief in about 30 seconds.

CASE XIII.—*Frontal Cephalalgia.*—Mr J. L., æt. 43, informed me on 16th November, that on the previous Wednesday, 13th November, he was suffering from very severe frontal headache, an ailment from which he often suffered. His brother, Mr R. L., applied the treatment from which his wife (Case XI.) had derived so much benefit. The headache immediately disappeared, and had not recurred.

CASE XIV.— Vertical Cephalalgia.—Mr A. B., æt. 20, complained on 9th November of a dull, pressing pain referred to the vertex. It had been felt for over a year, but during the past two months had increased in severity, and often prevented him from sleeping. With treatment he had almost immediate relief. Again consulted me on the 15th November. The pain had returned, but in a modified degree. It again immediately gave way to treatment. I saw this patient in the beginning of November, when he told me that there had been no recurrence.

The following group of cases is interesting, as the neuralgia had followed other pathological conditions from which it was eliminated:

CASE XV.—Neuralgia following Herpes.—Miss S. S., a young lady, informed me on 14th October, that in the summer of 1888 she had an attack of herpes—the neighbourhood of the right eye and right side of nose being the area affected. There were distinct cicatricial signs of the disease. With the herpes there had been excessive pain in the same region, often radiating over the side of the face. This lasted for some months, and had resisted all forms of treatment. When I saw her, more than a year after the commencement of the attack, there was still a dull pain in the right temple. It was not severe, but was distinctly present. With treatment there was almost instant relief, and I have not heard of any recurrence.

CASE XVI.—Orbital Neuralgia accompanying Facial Erysipelas.— Mr A. P., et. 47, had suffered from pain in left temple since 27th October; on the 31st a herpetic eruption appeared around the left eye; on the 1st November there was erysipelatous inflammation of the left side of face generally. When I saw him on the 3rd I found this very marked, and he complained, and was most evidently suffering from excruciating pain, referred to the left orbit, which he said had been present about 18 hours; with treatment the pain disappeared in a few minutes.

9th November.—Patient is recovering from the erysipelas, and there has been no recurrence of the orbital pain.

CASE XVII.—Neuralgia accompanying Glossitis.—Mrs C., æt. 40, began to suffer about the 14th September from idiopathic glossitis, of which the symptoms were of the ordinary character. Pain was not much complained of, and the case seemed to be progressing favourably. On Sunday, 22nd September, I was urgently asked to see the patient, who was then suffering from acute pain, mostly referred to the area of distribution of the right inferior dental nerve, but also present in the tongue. There was immediate relief on treatment. The pain recurred once or twice during convalescence, but was immediately arrested by the same treatment.

CASE XVIII.—*Cephalalgia accompanying Tonsillitis.*—Mrs F., æt. 51, had suffered since 28th October from acute tonsillitis. On the 2nd November, when I saw her, the tonsillar symptoms had almost disappeared, but she complained of severe frontal headache, of great pain in the left orbit, and of pain less severe in the right. The pain had been present for some days, but as the patient thought it was a part of the ailment for which she was being treated, she had not mentioned it. With insufflation of chloride of sodium there was complete, but somewhat gradual, disappearance of the neuralgia. Patient got almost immediate relief from the acute pain, but thought that the headache, etc., had not entirely gone until about 20 minutes from the commencement of treatment.

19th November.-No recurrence.

CASE XIX.—*Cephalalgia accompanying Tonsillitis.*—Miss S. H., æt. 25. This case was similar to the above, but the patient complained of severe frontal headache on the first day of the incidence of tonsillitis, 6th November. In this case there was instant disappearance of the pain, with no recurrence.

It early occurred to me that spasmodic asthma would probably be benefited by the same method of treatment, and very soon I had an opportunity of testing effect, and with gratifying success.

CASE XX.—Bronchial Asthma.—Mrs L., æt. 24. I was called to see this patient on 2nd September, when I found her suffering from the well-known symptoms of an acute attack of bronchial asthma. There was marked dyspnœa, the respirations being laboured and noisy. On auscultation, sibilant and sonorous rhonchi were heard over both lungs. In all respects the case was a typical one, and the various symptoms need not be detailed. With treatment, there was complete relief from the asthma and all distress in a few seconds, with disappearance, nearly complete, of the auscultatory signs.

3rd September.-I saw the patient about noon, the asthma

had returned in a modified degree. Treatment had the same result as before. I then gave directions for self-treatment, and the husband subsequently informed me that the asthma did not again appear until the 6th September, at 6 A.M. It again immediately gave way to treatment.

10th November.—I have seen patient to-day, who informs me that she has had no recurrence.

I have treated other two cases of asthma—one a gentleman, æt. 50, with results almost as satisfactory as those given in Case XX.; and another, an elderly gentleman, where there was a considerable cardiac element in the disease, with little appreciable effect.

I cannot give details of my two unsuccessful cases, because neither occurred in my own practice or district, and I only saw the patients on single occasions. Both were long-standing cases of neuralgia of the fifth nerve, in one case of all its branches, and in the second of the infra-orbital branch. In both cases hypodermic injections of morphia had been often used, and in the second the operation of nerve section had been performed. The only feasible explanation of this failure which occurs to me is, that on the pathological nerve condition, expressed by the neuralgia, there had been superimposed a second deviation from the normal by the morphia, and that the resultant disease was not amenable to this form of treatment. Those who have seen the profound nerve change following morphinomania will grant that this hypothesis may be correct.

In neuroses other than those which I have treated, it is possible that this method of inhibition may be used with success. The first dentition of children is often accompanied by much irritation of the dental nerves, and this gives rise to many of the grave complications attending this period. It may be urged that the cause would be left, but I think that it is demonstrated, that the element of pain may be eliminated from pathological conditions with great general relief. I have already made arrangements for observations of the effect of treatment in a large number of cases of epilepsy in an Institution under my medical care.

Dr Brakenridge remarked that the idea of relieving neuralgia of the fifth, as well as frontal headache, by means of stimulation of the nostrils was by no means new. Every one was familiar with the use of a scent bottle in headache. After a suggestion made to him by Dr P. M'Bride he had frequently, during the last few years, used a very strong snuff containing a little pepper with distinct effect for the relief of facial neuralgia. By this means the pain had been, in many cases, promptly relieved. In none, however, had he met with such permanent cures as those reported by Dr Leslie as resulting from the employment of salt. The following case bore upon Dr Leslie's suggestion, that salt applied to the nostril might possibly prove to be a means of arresting epileptic seizures. An old lady suffered from severe and painful attacks of shaking of the left arm and leg, which were believed to be due to a carcinomatous tumour situated at the upper part of the fissure of Rolando. These fits of Jacksonian epilepsy could be entirely controlled by the prompt use, when they threatened, of a very strong scent bottle. A very remarkable point in connexion with the cure which had proved so effectual in Dr Leslie's hand, was that in health the nostrils were naturally laved with tears, which were simply a strong solution of salt. Was it not possible that some interference with the passage of tears through the lachrymal ducts into the nostrils, and the absence from the nerve endings there of their natural stimulant, might have something to do with the production in the centre for the fifth nerve of that altered condition which was manifested by pain? The special value of salt in relieving neuralgia might thus be explained.

Dr Watson Campbell said he had been much interested in the report of the cases read by Dr Leslie, as well as in the treatment and the success which followed. He had been reminded of the treatment by a friend many years ago, of all cases of facial neuralgia, which was somewhat like that adopted by Dr Leslie; this was the use of vinegar instead of salt. He used to fill a teaspoon and bring it close under the nostril of the affected side, and, compressing the other, tell the patient to draw it up by a sudden nasal inspiration. He had seen a good number of severe cases relieved, if not cured, instantaneously in this way, and yet he could give no reason why he had not followed the same treatment in the cases that had occurred in his own practice. Referring to the effect of insufflation in bronchial asthma, he said an allied case of rather serious interest occurred in his own family. About three years ago his son, then thirteen years old, suffered much from spasmodic cough. His ailment began like an ordinary cold, but soon assumed marked peculiarities. The cough was never followed by expectoration. It never disturbed the patient during night, but the instant he woke in the morning a very violent fit of coughing came on, and did not cease till the boy was quite exhausted. It was soon noticed that it recurred at regular intervals; these were very short from the outset, and stood for a long time at an hour. After a while—he could not remember how long—the intervals diminished to thirty minutes. In treating the case attention was given to the bowels. Quinine, arsenic, and iron were given; sinapisms were applied to the spine; douches, hot and cold, were used, but none of these afforded the slightest relief. The inhalation of ether arrested the cough at once, but did not prevent its return, nor extend the interval. The consequence was that, owing to the frequency of administration, and the quantity used, the state of affairs became alarming, as the patient was hardly ever free from its effects. Fortunately it occurred to him to try the effect of swabbing the throat with a solution of nitrate of silver, and this

being found quite successful the ether was put aside. Again, however, it was found that this treatment only stopped the cough, but did not prevent its recurrence, and feeling uneasy about the quantity used, he thought he would try a solution of alum. This answered quite as well as the other, and was not likely to prove injurious. The patient, however, required a constant attendant with the swab ever ready for application-an inconvenience which can easily be conceived. Drs G. W. Balfour and M'Bride saw him and heard him cough, and both agreed with Dr Campbell that it was reflex. They approved of the treatment that was being followed, but further suggested a visit to the Channel Islands or a long voyage. There was, however, an objection to island or voyage which it was difficult to overcome, and, luckily, something equally good was soon stumbled on. A friend who heard him cough on one occasion suggested snuff, in the hope that "ae diel wad ding oot anither "-that sneezing would stop coughing. This was at once tried, and the result was simply marvellous. The tiniest pinch was sufficient to arrest the spasm at the beginning, and the patient, being provided with a small box of snuff, was able to attend to himself. In a comparatively short time it was observed that the intervals lengthened, and, within three weeks from the first pinch, the cough entirely left him. Dr Campbell said that there was one very remarkable thing about the remedy in this case: if the patient ventured to indulge in a pinch, when not required, he was punished by violent sneezing, whilst it seemed powerless to cause this when taken to check the cough. He mentioned this case rather particularly, because he thought it interesting in itself, and as also tending to show that other substances besides salt were of service in such cases as Dr Leslie had reported. As for the modus operandi-he would not attempt to explain it. but these remedies seemed to him to have a *divertive* action.

Dr James had to express the pleasure which he had felt in listening to this interesting paper, and he had no doubt that, like others present, he would take the carliest opportunity which presented of testing the practical value of Dr Leslie's mode of treatment. What he had to say just now, however, was not in the way of criticism. He wished merely to state some ideas which occurred to him when hearing the paper read. In the first place, salt seemed specially useful in cases of nerve disturbance and pain. In hay-asthma the injection of salt and water into the nostrils was often beneficial, in quinsy the rubbing of the affected part with salt might ameliorate the symptoms, and in toothache the old plan of rubbing salt or soda on the gum was well known. But how might the application of chloride of sodium to the nasal mucous membrane alter neuralgic pain? It was evident that facial neuralgias should be specially amenable to such treatment, for in them all, only one nerve, the fifth, was concerned, and so they might expect that the application of a remedy to the

peripheral termination of one branch would readily affect the others. In this connexion, however, the statement made by Dr Leslie that bronchial asthma was similarly ameliorated by this treatment was interesting, because here they had another nerve, the vagus, involved. Another point was that the nasal mucous membrane was specially sensitive. Physiologists know that whilst the sensibility of the tongue at different parts might be tested by the galvanic current, it was impossible, or nearly so, to perform any similar test as regards the nose, owing to the intense pain which the electricity caused. The application, therefore, of any substance to the nasal mucous membrane might be supposed to act with specially great effect; but, on the other hand, from his own experience he could testify that the application of salt in the manner proposed by Dr Leslie was not painful. Should salt act better than other substances? From Dr Leslie's results it would certainly seem to do so. Other substances could, however, act beneficially, for, as was well known, the habitual snuffer seldom suffered from cold in the head.

Dr Smith said he was very much interested by what Dr Leslie had brought forward in his paper. He was at a loss, however, to understand how the peculiar curative action of the remedy was effected. Neuralgia properly so called was ascribed to various pathological changes either in the nerves or nerve sheaths, or in the nervous centres themselves. Other forms of pain often denominated neuralgia were due to organic changes in structures where sensory nerves were distributed. In odontalgia, for example, the pain arose from various pathological conditions which until they were removed would continue to act as its exciting cause. The pain here might originate in mere exposure or in gangrene, or even mere ædema of the pulp, or other lesions, producing irritation of some kind. How, then, unless the insufflation of salt into the nostril acted by paralyzing exclusively sensation in some reflex manner, did it permanently cure the state of matters in Dr Leslie's cases? If it were merely the pain which was thus arrested, he supposed some alteration in the molecular elements of the nerve, or even, in certain of the cases, in distant nerves must have been effected; or some selective influence have been transmitted to the nerve centres productive of lasting effects. He considered the paper an extremely interesting one, and would like to know if Dr Leslie held any particular views as to the rationale of the treatment.

Mr Cathcart thought that the subject raised by Dr Leslie might be considered to be part of a larger one, namely, that there is a nervous association between certain sensitive cutaneous and mucous areas and deeper parts below. The mucous membrane of the nostril being part of the respiratory tract, its nerves might be associated with those supplying the lung and also with the facial nerve, since some at least of the facial muscles were respiratory. This was analogous, at least, to Hilton's theory that the same nerves which supplied joints, supplied also the muscles acting on those joints and the skin over these muscles or their insertions. This theory had recently received support from Charcot's hypnotic experiments. He did not think that we need exclude real inflammations from those affected in this way, because in surgical practice it was common to find that counter-irritation greatly improved the condition of actual inflammations.

Dr M'Kenzie Johnston said that his difficulty in comprehending Dr Leslie's paper was due to the almost universal success which had followed his treatment. He could have better understood it had there been more failures. Neuralgia was a symptom, not a disease, and was due to various and many causes. Yet the same simple treatment seemed to cure them all. How did Dr Leslie explain his treatment? Was it the result simply of counter irritation of the nerves in the interior of the nose? Hack and Mackenzie of Baltimore had shown that there was a sensitive spot on the inferior turbinated body which gave rise to various neuroses, and they recommended counter-irritation of this body for neuralgias due to swelling or inflammation of it. M'Bride in a paper published in 1884 went further, for he recommended cauterizing even the interior of the healthy nose in cases of troublesome neuralgia. He (Dr Johnston) had seen other applications to the nose produce an explosion of nerve force, and so relieve nervous cough. He had used snuff on himself during a paroxysm of irritative cough, and boracic acid, coffee, quinine, etc., insufflations had been used in whooping-cough. He thought Dr Leslie had done good by drawing attention to this subject, as it showed the importance of examining the interior of the nose.

Prof. Greenfield considered that Dr Leslie's communication was of great value, as indicating that pain might be removed by very simple means without removing the cause, and instanced cases of severe persistent localized pain which had been cured whilst the apparent cause continued. The paper might well call the attention of medical men to the revision of the current views as to the physiology and pathology of pain.

Dr D. W. Aithen suggested that the effect of the remedy might be explained by the physiological fact that, if, while along one branch of an afferent nerve an irritation is carried to a centre, another afferent branch of the same centre is stimulated, the former central state is neutralized. As an illustration a case of Prof. Chiene's was mentioned. The patient suffered from pain and spasms in connexion with the upper part of the 5th as well as of the facial. Prof. Chiene pressed firmly upon the infra-orbital as it emerges from the foramen with instant relief of the symptoms.

The President said the Society was greatly indebted to Dr Leslie for his interesting paper. Dr Leslie had recorded an important series of cases, honestly relating his failures as well as his successes,

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and explaining how he had been led to adopt the treatment for neuralgia he had now submitted to his professional brethren. The measure he had proposed was simplicity itself, and was so safe in its nature that many members of the Society would no doubt put it to the test in their own practice.

Dr Leslie thanked the members for their kind reception of his paper, and for the able discussion which had followed it. The study of his cases had led him to the conclusion that neuralgia is a disease in itself, and not a necessary accompaniment of certain pathological conditions, such as gangrenous tooth-pulp, referred to by Dr Smith, which might precede it. He was glad that Professor Greenfield supported this view. In reply to Dr James, he did not think that the term counter-irritation applied to the action of chloride of sodium was quite legitimate, although doubtless there was counteraction, nor was he aware that mere alkalinity could explain the reflex inhibition of pathological nerve impulse. The afferent nerves concerned were almost certainly branches of the fifth, and not of the olfactory. He had designedly restricted the scope of the present paper to practical results, and had avoided theoretical considerations, but had been greatly interested in many points of nerve physiology, especially those concerning the essential nature of neuralgia, the nervous element of spasmodic asthma, etc. He submitted that his method of treatment formed a new basis for their study.

2. ON THE TREATMENT OF GANGRENOUS BOWEL IN STRANGULATED HERNIA.

By FRANCIS M. CAIRD, F.R.C.S. Ed., Assistant Surgeon, Royal Infirmary ; Lecturer on Surgery, School of Medicine, Edinburgh.

WHEN about to discuss the treatment which should be carried out in a case of strangulated hernia with gangrenous bowel, it is well to note the more usual sites and extent of the gangrenous areas. We may do this by observing the state of the bowel when exposed during operative interference, or by the examination of museum preparations. Femoral hernia, more especially, affords us an opportunity of inspecting good examples of this condition.

In regard to the question of position, it would appear, from a study of the preparations and cases, to which I have had access, that we may find changes of a gangrenous nature situated as follows:—First, on opening the sac and within it, a projecting knuckle of bowel may be met, gangrenous on its free border. Second, in dividing the constriction at Gimbernat's ligament, a similar condition may be found immediately beneath the point of stricture. Third, on pulling down the dilated vascular gut from out the abdominal cavity, it may be found damaged above the entrance into the sac. Fourth, but rarely, there may be a gangrenous patch on the collapsed portion within the abdomen beyond the sac. It seems that necrosis may occur at any one, or even at all of these points.

If we now remove the bowel, and spread it out so as to expose the gangrenous areas more clearly, we note that, if several be present, they occupy the positions already indicated, and are separated from each other by a distinct interval of comparatively healthy tissue. In regard to the extent of the necrotic change, we may note that the area which lay beneath the constriction is more or less annular in form. It resembles a signet ring, the bezel towards the free convex border of the gut and the ring, more or less complete, narrowing and tailing off towards the mesentery, as in Plate III. fig. 1.

The patches at the remaining sites are all more or less oval, run in the long axis of the bowel, and lie opposite to the mesenteric attachment. Their extent will naturally vary with the duration and circumstances of the hernia, Plates II. and III.

As to the treatment of the constricting agent, when one meets with gangrenous bowel in a hernial sac it is evident, from what has already been adduced, that it must be divided in order to judge of the condition of the bowel beyond. And in cases where the bowel has already ruptured, a stream of antiseptic lotion may be employed to thoroughly wash away fæcal extravasations, and to disinfect while the stricture is divided.

There is now a choice of treatment. If the gut has not yet actually given way, the surgeon may return it, hoping that within the peritoneal cavity there is still a remote chance of its recovery. Or, again, he trusts to the local paralysis preventing it from straying far from the wound, he hopes that local adhesions and effusion may shut off the damaged gut from the peritoneum, and that if, after all, death of the part should take place, that in this fashion general infection may be prevented, and at the outside only a faecal fistula ensue. Again, he may prefer to stitch the gut to the wound, thus forming an artificial anus. Or, again, he may venture to carry out the more heroic resection of the gangrenous gut, and by suture restore its continuity.

I would venture to add yet another method which, under certain circumstances, might prove highly serviceable. It is, that in place of making an artificial anus, or practising resection, we should close the rupture in the gut, or prevent its formation by inverting the dead or dying tissue, and suturing the sound wall of the bowel over it. The invagination thus carried out will be at the expense of the circumference of the gut, and must, of course, leave a somewhat diminished lumen.

The gut should be withdrawn as represented in Plate II. figs. 1 and 2, and closure effected as in Fig. 3, by means of Lembert's suture. The needle must enter healthy tissue, and emerge in tissue that is fairly healthy, and the stitches should begin above, and end beyond the gangrenous area, just as in suture of a ruptured bladder. The invaginated portions subsequently slough, and are passed by the natural channels.

The method is chiefly applicable to the small gangrenous areas which lie in the long axis of the gut. It might also save resection in bullet and other wounds of the intestinal tract.¹ It can be carried out rapidly, there being nothing to cut away, and therefore no hæmorrhage to control. The stitching is rendered much less troublesome by the use of Dr J. M. Cotterill's intestinal needles.

We have, however, to ask what evil results may follow from such treatment. One dreads the formation of a stricture. However, in the case of suture in the *longitudinal* axis of the gut, where not more than one-third of the circumference is included, one would probably have little to fear on this score. Little or no contraction is likely to follow after the primary suture. And, again, if we are dealing with the small intestine, the fluid character of the contents is not likely to give rise to much trouble, even with a somewhat narrowed lumen. On the other hand, where there is a damaged *ring* of tissue, general contraction giving rise to a marked stricture often ensues. Such a ring of dying tissue is figured on Plate I. fig. 1, which shows the appearance of a piece of gut pulled down after division of the stricture in a femoral hernia. The damaged area resembled a piece of wet wash leather.

Fig. 2, Plate IV., shows what may follow on the reduction of such a damaged gut. The patient suffered from strangulated hernia, and made a favourable recovery from the operation. Progressive symptoms indicative of stricture followed, interference was not permitted, and seven months after the original operation the preparation was obtained. Such an event is indeed to be dreaded. But are we here more justified in looking for the formation of stricture after invagination of the necrotic area and suture than after an ordinary resection ? Our hope is that the invaginated portion may at once slough and be cast off; that the suturing may indeed complete the necrosis, by cutting off the blood supply of the invaginated part; and that as the slough is cast off a natural cure. similar to that seen occasionally in intussusception, may be brought about. We hope, indeed, for a result similar to that in Plate V. fig. 1, where we see how very little diminution has been wrought in the lumen of the dog's intestine after the application of a ligature which subsequently passed per anum.

The method described, then, is an attempt to apply Nature's teaching. To what extent we may venture to diminish the lumen of the bowel can only be learned by vivisection or the study of cases in man. In every case a careful selection of some one of the various plans of treatment must be made, and this can only be determined by the condition of the patient generally, the local state of the parts, and the resources of the surgeon.

¹ See Parkes, Gunshot Wounds of the Small Intestine.

The following are a couple of cases in which suture of the gangrenous gut was followed out:—

Mrs M. was seen by Dr Alexander Edington on a Sunday morning, suffering from a strangulated hernia, which had been "down" since Friday. Taxis having proved unsuccessful, herniotony was carried out with the aid of Dr Edington and Dr Milligan. The sac contained straw-coloured fluid, and the gut was not deeply congested. On division of the constriction at the neck, and on pulling down the bowel, a couple of rents came into view, with ragged, everted edges, as represented on Plate II. fig. 1. There was no fæcal extravasation. The parts were invaginated and sutured with catgut, as described, under antiseptic precautions, the bowel returned, and the wound closed. The patient made a good recovery, and since that date has enjoyed good health, and the intestinal functions are perfect.

No other suitable case for suture presented itself until 1889, when I saw at her own house Mrs C. She had a pinched, worn look, suggestive of peritonitis. There was continuous fæcal vomiting. The home arrangements not proving suitable, she was removed to the Royal Infirmary, and there operated on. The sac contained brownish fluid, a tag of omentum, and a knuckle of gangrenous bowel, Plate II. fig. 2. The gut was deeply congested. An ovoid longitudinal area opposite the mesenteric attachment was greyish white, flaccid, and lustreless, but had not yet given way. Gimbernat's ligament was nicked, the gut pulled down, the omental tag returned, and the dying area turned inwards, sound tissue being brought to sound tissue by interrupted sutures, as in Plate II. fig. 3. Since the inverted tissue in which the sutures were planted seemed in a very doubtful condition, and since the bowel contained fluid contents, it was deemed advisable to apply a second layer of continuous Lembert sutures over all. The finest Chinese silk was used, and rendered still finer by splitting it up into fibrils, so that the sutures were as delicate as gossamer. This procedure allows one more readily to thread Dr Cotterill's needles.

No attempt was made to attain a radical cure. Horse-hair sutures were inserted into the lips of the wound, but were not tightened. On the third day, all having gone well, the horsehair was tightened and the wound was closed. The patient did well, passing wind about thirty hours after operation.

At the end of three weeks she was about to be sent home, when she complained of much morning sickness. She was in the third month of pregnancy. The sickness and nausea continued with intermissions. She had attacks of voniting. At no time was there any obstruction—wind always passed freely. The bowels required an enema to clear them. There was at no time any abdominal tenderness, or pain, or swelling in the region of the cicatrix. The abdomen was always lax, and moved freely during respiration. The unsatisfactory state of affairs continued, and it was thought advisable to explore, when she suddenly had an attack of diarrhœa, passing most offensive motions; the heart's action, always weak, became very irregular, and she sank four weeks after the operation.

At the autopsy there was not the slightest evidence of peritonitis. A loop of ileum was fixed to the internal aspect of the crural ring, and crossing it anteriorly, attached to the same point, lay the tag of omentum which had been seen during the operations. This had evidently acted as a constricting band. The gut was intact. On removal, the bowel was laid open. A pyloric-like ring of constriction, which could only admit the little finger, showed the site of the operation (Plate I. fig. 2). Immediately above it the mucous membrane was distinctly ulcerated, and thus the diarrhœa was accounted for. The heart showed marked fatty degeneration.

It is noteworthy that we found here a short localized general contraction, instead of a lumen only narrowed slightly for about an inch in length. The success of the first case was, however, so marked that one felt encouraged to carry out similar treatment in the second instance, although the unfortunate result shows that the vitality of the gut had been too greatly lowered. It is probable that a reactionary congestion and inflammation set in beyond the range of the sutures, and that the subsequent cicatrization of the effused products, more especially in the infiltrated sub-mucous tissue, gave rise to the contraction. Contraction may occur with great rapidity. In the museum of the Royal College of Surgeons there is a preparation showing a strictured gut which barely admits an ordinary lead pencil, and which was found formed nine days after the reduction of a strangulated femoral hernia.

My thanks are due to Prof. Chiene, who supplied me with preparations, and in whose wards Case II. was treated. I am also indebted to Prof. Sir William Turner, Curator of the University Museum, and Mr C. W. Cathcart, F.R.C.S., Curator of the Museum of the Royal College of Surgeons, as well as to other friends, for the use of preparations and for kindly assistance.

ILLUSTRATIONS.

PLATE I.

- FIG. 1.—From a case of femoral hernia, showing the ring-like gaugrenous area formed at the seat of constriction.
- FIG. 2.—Posterior view of preparation from Case II., showing—a, colon; b, ileum; c, omental tag; d, parietal peritoneum; e, part of abdominal wall; f, reflected wall of bowel, exposing the pyloric-like constriction into which a probe, g, has been passed.



FIG. 2.—From a case of strangulated Femoral Hernia, showing the ring-like gangrenous area formed at the seat of constriction.



FIG. 2.—Posterior view of preparation from Case II. a, Colon. b, Ileum. c, Omental tag. d, Parietal peritoneum. e, Fat of abdominal wall. f, Reflected wall of bowel exposing the pyloric-like constriction into which a probe, g, has been passed.



FIG. 3.—Lembert's sutures so passed as to secure invagination of the ruptured and gangrenous area, and approximation of the more healthy area beyond.



F1G. 1.—Aspect of the bowel in Case I., after division of the stricture and pulling down of the gut. The bowel is seen to have given way at two points, one at the constriction and one above it.







FIG. 1.— From a case of Obturator Hernia, showing the ruptured portion, a, found in the sac, and the more annular destruction, b, at the site of the constriction.

FIG. 2.—From a Femoral Hernia. Numerous performations, a, are seen in the knuckle of gut which lay in the sac. Only the thin viscental performance interce over b, but the rest of the layers were entire at c. Ulcention beneath the constriction is seen as d.





Fig. 2.—Dense pyloric-like stricture which developed at the site of constriction in a strangulated Remoral Hernia. Preparations obtained seven months after operation— a_i reflected wall of bowel, displaying b_i the stricture.

PLATE II.

- FIG. 1.—Aspect of the bowel in Case I. after division of the stricture and pulling down of the gut. The bowel has given way at two points—one at the constriction and one above it.
- FIG. 2.—The bowel as exposed in Case II., showing the gangrenous area a, and the tail of the omental tag b.
- FIG. 3.—Lembert sutures so passed as to secure invagination of the ruptured and gangrenous area, and apposition of the healthy area beyond.

PLATE III.

- FIG. 1.—From an obturator hernia, showing the ruptured portion, α , found in the sac, and the more annular distinction, b, at the site of constriction.
- FIG. 2.—From a femoral hernia. Numerous perforations, a, are seen in the knuckle of gut which lay in the sac. Only the thin visceral peritoneum remained intact at b, but the rest of the layers were entire at c. Ulceration beneath the constriction is seen at d. The destructive changes take place from the mucous surface outwards.

PLATE IV.

- FIG. I.—Portion of a small intestine of a dog with the arteries injected. A circular band, resembling a pylorus, is seen internally, with the intestine dilated above and below the constriction. The bowel was enclosed in a ligature which was discharged per anum the fourth day after operation, and the animal was allowed to live three weeks subsequently. Preparation in the Edinburgh University Museum. Presented by George Trusted, Esq.
- FIG. 2.—Narrow pyloric-like contraction which developed at the seat of constriction after operation for strangulated femoral hernia, and which proved fatal seven months afterwards. *a*, reflected wall of bowel ; *b*, stricture.

Prof. Chiene believed that the suggestion of Mr Caird was a valuable one. He had imitated Nature's methods. Prof. Chiene congratulated him on the clearness with which he had demonstrated the method, and it appeared to him well worthy of more extended trial. The fatal result in the second case was, in his opinion, altogether unconnected with the procedure by which the dead portion of the gut was invaginated within the lumen of the bowels. The only difficulty in the operation seemed to him to be this, that it would not always be an easy matter to fix the points where the stitches were to be introduced, nor would it be an easy matter to say how much of the bowel was to survive, how much to die.

Mr Cathcart thought that since the vitality of the whole of the strangulated bowel was generally impaired by the strangulation, it would only occasionally happen that the ulcerated patch on the included bowel could be treated as a small punctured wound would be in a piece of healthy intestine. In other words, that stitches could not be relied upon when passed through bowel which, if not already inflamed, would probably become so when the circulation was restored. Further, with regard to the transverse ulceration at the seat of constriction, he was not prepared to admit that no constriction would be likely to follow its being stitched together, because none followed the healing of a piece of sloughed bowel in intussusception. In the latter case the included bowel was gangrenous and sloughed away, but in Mr Caird's case the included part was only impaired in its vitality, and might survive as an internal spur. While agreeing with the most of what Professor Chiene had said, he thought that the presence of an ante-mortem stricture, not demonstrable post-mortem, might sometimes be also explained by muscular spasm as well as by paralysis.

Dr Scott Lang asked whether Mr Caird would not lay more stress on the question of the condition of the patient, and the urgency of the symptoms. He had recently operated on a case where the bowel was found gangrenous, but as the patient's condition was not critical he decided not to pull down any more gut, but to leave it undisturbed. True, a faecal fistula formed, but it was subsequently cured, and the woman is now well.

Prof. Greenfield said that the operation suggested by Mr Caird followed the natural process occasionally seen in intussusception, in which the intussuscepted portion of the bowel sloughed away. In a case from which specimens were shown, a long piece of the small intestines had thus been discharged, and on the death of the patient several months later, it was found almost impossible to determine the exact site of the separation, as there was no stricture, and but little alteration of the mesentery. Two risks were, however, to be faced : one, that of the production of temporary obstruction, as in intussusception, the other the possible formation of a stricture. As to the first, the bowel in that region being probably temporarily paralyzed, it was possible that there was less risk than in intussusception. As to the second, it was certain that a stricture did not necessarily result. On these grounds the operation certainly appeared to merit trial, unless other methods were found which were free from the present risks.

Mr Caird thanked the society for their reception, and in reply to the kindly criticism he had received, wished to lay stress upon the point, that he by no means insisted on the method he advocated as being of universal application, but that the amount of the gangrenous area, the condition of the adjacent gut, and the state of the patient, must all be taken into consideration in every case. Thus in the first case which proved successful, although the bowel had already given way, he had not only sutured, but returned it, and attempted a radical cure by closing the ring. In the second case, which ultimately died, he left the bowel, which had not yet given way, close to the ring in case it should get ruptured, and made no attempt to close the wound. He was not very apprehensive of the invaginated mesentery forming a spur in the cases where the whole circle of devitalized gut was included, since Madelung had shown that the very interference in this way with the mesentery determined that it would now slough; but even if this did not occur, one could assure it by pinching the mesentery before
inclusion, and so effectually determining that it should be east off. He had also to indicate the ease with which intestinal suture could be performed if we used Dr Cotterill's needles. He begged to thank the various gentlemen who had given him facilities for examining the preparations in their possession or under their care."

Meeting III.—December 4, 1889.

Professor A. R. SIMPSON, President, in the Chair.

I. ELECTION OF NEW MEMBERS.

The following gentlemen were elected Ordinary Members of the Society :-Alfred W. Hughes, M.B., C.M. Ed., M.R.C.S. Eng., 42 George Square; Thomas Proudfoot, M.B., C.M., M.R.C.P. Ed., 13 Lauriston Place.

II. EXHIBITION OF PATIENTS.

1. Dr Kennedy showed a boy, three years old, affected with RICKETS, and showing symptoms of PSEUDO-HYPERTROPHIC PARA-LYSIS. The chief signs of rickets were thoracic constriction at the level of the ensiform cartilage, curving of femora, knock-knee, and bending forward of lower end of tibiæ-all slight. The paralytic phenomena consisted, in a noticeable degree, of waddling on walking, the toes at the same time grasping the floor firmly, and the characteristic movements in rising from the ground to the erect position. These symptoms had been much more marked five months before, when they were quite typical, and improvement had since then been progressive. When a year old he had begun to walk, but an attack of measles threw him back, so that he made no effort till nearly two years old. He spoke quite as soon as other children. Inflammatory irritation between the glans and prepuce necessitated circumcision five months ago, the parents being warned before the operation of the probability, in any case, of increased paralysis. The only other treatment was massage of the legs and back, performed by the mother. Though under the impression at first that this was a case of commencing pseudo-hypertrophic paralysis, the marked improvement had led him to believe that the symptoms were only due to weakness of the muscles of the back and legs associated with rickets.

2. Dr A. Miles showed a CASE OF SKIN GRAFTING WITH SKIN OF DOG, and read the following notes :--Patient is a boy of 10, and somewhat delicate. He was treated in Mr A. G. Miller's Wards, Royal Infirmary. On 22nd April (a month before admission) he had his

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left leg scalded with boiling water. On 24th May he came to hospital. The whole of the skin from the middle of the patella to the ankle, with the exception of a small island, 2 inches by 1 inch, on front of the tibia, was completely destroyed. Treated with boracic lint dressings for a fortnight, but no evidence of cicatrization. On 6th June a young greyhound was killed, and the skin of the anterior abdominal wall dissected up in its entire thickness after having been shaved. This large flap was cut into strips 6 inches long by 1 inch broad, and these planted on the ulcer. Smaller grafts were put on to fill up the interspaces. On dressing after three days, only one small graft was found to have failed to take. Cicatrization went on rapidly from the grafts, and also from the margins of the ulcer, and in six weeks the whole leg was covered with a strong cicatrix, with practically no contraction. It is now over three months since the patient was last under treatment, and he is attending school and in perfect health. It may be added that there is as yet no evidence of the reproduction of hairs and no secretion from the skin, but the sensation of the cicatrix is quite as good as that of other parts of the limb.

3. Dr John Thomson showed a CASE OF PROGRESSIVE IDIO-PATHIC MUSCULAR ATROPHY in a young child. The patient was a girl aged 4 years and 5 months. At 12 months of age she was a remarkably fine strong child, and had then for two months been able to walk round the room holding on to the chairs. The weakness began soon after in the legs, and before she was 21 years, she could not stand at all. When 2 years and 4 months old, she was in the Children's Hospital under Dr Playfair, and at that time her arms and neck were unaffected. They became affected, however, about a month later. During last year the general weakness had increased slightly, but there was no great change. There was no history of any similar affection in any member of father's or mother's families. The child's attitude was strikingly expressive of her profound muscular debility. There was no extreme wasting of any muscles, nor any trace visible of hypertrophy or pseudo-hypertrophy. The feet were distinctly pointed, and the fingers had a tendency to become hyper-extended. There were no sensory symptoms except diminished sensibility to pain; the organic and skin reflexes were normal; the knee jerks were quite absent. The voluntary muscles of the trunk and limbs were all, or nearly all, affected more or less. Those concerned in ordinary respiration, speech, and deglutition, and those of the face and eyes, seemed unaffected. There was very little power of movement left in the legs and loins, and the back, abdomen, and neck were also extremely weak. The shoulders and arms were less affected. Most of the muscles seemed about normal in size : none were much wasted. and none visibly enlarged. A few felt harder than normal; the calves had the feeling of fatty tissue. Co-ordination was perfect.

Electrical excitability had been tested by Dr Milne Murray, who found the faradic irritability considerably impaired, and the galvanic reaction much more so—in fact, scarcely to be obtained. The legs and feet were constantly cold. The case was regarded as probably one of primary myopathy belonging to the class described by Professor Erb as the "juvenile form" of progressive muscular atrophy, but the pathology of it was very obscure. It differed from the previously published cases in many points, and the patient was very much younger than in any recorded case of anything like equal severity.

III. ORIGINAL COMMUNICATIONS.

1. THE ELECTRIC CYSTOSCOPE.

By DAVID WALLACE, F.R.C.S. Ed.

MR PRESIDENT AND GENTLEMEN,—The endoscope—or, better, the cystoscope—is no new idea, but latterly the instrument has been so perfected as to bring it within the range of practical surgery; and, as I hope to show to-night, it is now of the highest value in aiding the accurate diagnosis of obscure genito-urinary affections.

Shortly, the history and evolution of the instrument have been as follows :- In 1805 Dr Bozzini of Frankfurt advanced the idea that the bladder might be examined visually, and in that year he exhibited an apparatus devised by himself, which, in his opinion, fulfilled the object in view. His instrument was, however, found to be quite inadequate, because of insufficient illuminative power. In 1854 Désormeau introduced a cystoscope, which was further elaborated in 1865 by Dr Cruise of Dublin. Until 1877 the cystoscope may be considered to have been in its *first stage*, inasmuch as the light supply was from without, i.e., external to the bladder,-being projected along a tube by mirrors set at convenient angles. In 1877 the second stage, which may be called the electric, was reached, the light supply having since then been internal, i.e., within the bladder. Dr Max Nitze of Berlin in that year introduced the platinum loop cystoscope,-an apparatus made at his suggestion by a Dresden instrument maker. His apparatus had various objections, and was soon condemned on account of its clumsiness and the very defective light it supplied. Dr Nitze, therefore, along with Leiter, the well-known Vienna instrument maker, had the instrument simplified and improved. In 1879 Sir Henry Thompson said of the Nitze-Leiter apparatus, "That it was difficult to use successfully, although far more efficient than its predecessors. It was a large and unwieldy apparatus, so large that it could not be carried from place to place in a carriage, a circumstance which considerably diminished its sphere of usefulness."

In March 1887, for the first time, the incandescent lamp cysto-

scope was introduced,—two making their appearance almost at the same time, Dr Nitze's and Leiter's. These instruments are practically the same in their principle, but the latter—that of Leiter has a great advantage over Nitze's in that it can be repaired very quickly, even by unskilled persons.

Professor Chiene in the beginning of 1888 procured a Leiter incandescent lamp cystoscope from Vienna, and it is through his kindness that I have had opportunities of using the apparatus which I propose to describe and show to-night.

There are two forms of instrument—an anterior and a posterior. Each is shaped like a sound, and consists of three parts—the beak, the shaft, and the evepiece. Running from the evepiece to the beak there are two hollow tubes, an inner and an outer. The former serves to connect the electrodes of a battery-the source of electro-motive force-with the lamp, the source of light. The beak is a hollow cap which has a window of rock crystal, and contains a small Swan incandescent (Mignon) lamp, from which the light for illumination is emitted. In the anterior instrument at the concavity, where the shaft and beak join, there is a prism which refracts the rays of light from the object looked at on to the end of a telescope which passes from the evepiece of the instrument down to the junction of the shaft and beak. In the posterior instrument no such prism is necessary, but merely a plate of glass, as the object to be observed is in a line with the telescope and the observer's eve.

The ocular end has screws to connect the electrodes of the battery with the instrument, a kick-over to connect and break the circuit, and, on its rim opposite the concavity of the instrument, a small knob which indicates the position of the window in the cap, and thus enables the observer to know what part of the bladder is under examination.

The instrument has been variously modified in its details, but the original principle remains unchanged. Some of the modifications are improvements, and there are three which I think especially worthy of mention :---1st, The increased length of the instrument, which is of value for use in patients who have enlarged prostates. In such patients the urethra from this cause may be much elongated, and the original instrument is then too short. The increase in length of the cystoscope entails, however, the disadvantage that the field seen is smaller. 2nd, The addition made by Berkeley Hill of connecting an irrigator to the instrument without greatly increasing its calibre. This is of much value when bleeding is profuse-for in such cases the fluid in the bladder may become discoloured so rapidly that examination is rendered difficult, if not impossible. By the modification of Berkeley Hill the fluid can be constantly changed and the difficulty alluded to overcome. 3rd, The perforation of the cap as suggested by Mr Hurry Fenwick.

Whitehead has suggested the use of a much larger instrument,-

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the instrument to be passed through a perineal wound. This, no doubt, gives a larger field, but entails an operation, the avoidance of which constitutes one of the chief uses of the cystoscope. In the female, where the urethra can be easily and widely dilated, Dr Whitehead's modification would certainly be advantageous.¹

Various batteries have been used to supply the electro-motive force for illumination—" plunge batteries" being especially convenient. That of Voltolini is excellent in itself, and has the advantage of being supplied with a convenient form of rheostat fitting into the box. The rheostat is an indispensable adjunct to any battery used for cystoscopic purposes, as it keeps the light absolutely steady; and, further, the lamps used with the apparatus vary very greatly in their resistance, so that without the rheostat a current suitable for one lamp might readily vaporise the carbon of another, and thus completely destroy it.

To use the instrument we require to prepare the patient in the same way as for the passage of a bougie or sound. He is then placed in bed or on a table in the recumbent posture, and the bladder is then filled with 6 to 10 ounces of a clear fluid. If there be any hæmaturia or other cause of discoloration, the bladder requires to be washed out until the fluid injected into it comes away quite clear. This must be done very gently to avoid reinducing hemorrhage, which would readily arise from papillomatous growths, one of the conditions in which cystoscopic examination is of special value. The bladder having been filled with a clear fluid, the patient is brought down to the end of the bed or table with, preferably, his legs hanging over the end. The cystoscope, having been previously tested to ascertain that it is in good working order, is oiled and introduced into the bladder before the electric circuit is connected. When the instrument is fairly in the bladder, you apply your eye to the ocular end, connect the circuit, and with gentle movements examine methodically the whole bladder wall. During the examination it is necessary to avoid pressing the cap of the instrument against the bladder wall, as if it touch the wall the heat generated by the lamp is not radiated with sufficient rapidity, and the tip of the instrument becomes too hot. This danger is avoided by the use of Hurry Fenwick's perforated cap, which permits water to flow around the lamp inside the beak, and thus prevents any excessive rise in temperature.

The upper three-fourths of the bladder may be examined with the anterior cystoscope, the lower fourth with the posterior. I prefer to introduce the posterior first, as the more important bladder affections are found on the inferior third, and at this part we have

¹ In my opinion the best instrument at present for ordinary use is Leiter's, with two modifications :--(1) The perforated cap of Hurry Fenwick, and (2) the shaft an inch longer than in the original, as suggested by Sir Henry Thompson. The "kick-over" of the original instrument is, I think, a more convenient arrangement for closing and opening the circuit than the serew of Berkeley Hill's cystoscope.

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the ureteral openings, which should, if possible, be always examined.

When the examination is completed, break the circuit and withdraw the instrument. If not surrounded by water, in a few seconds it becomes very hot; it is therefore imperative, both when introducing and withdrawing the instrument, to shut off the electrical current.

The use of an anæsthetic is not always necessary, but it is certain that examination with the cystoscope requires considerable time. If, therefore, the patient be nervous or the bladder irritable, it is essential for thorough examination that he should be either locally or generally anæsthetized. Hurry Fenwick for local anæsthesia used 5j. of a 20 per cent. solution of cocaine, injecting this quantity along with the ordinary solution used to fill the bladder. In a footnote to his book he states that he has used the drug in this way in very many patients without any bad results.¹

I have now had opportunities, through the kindness of various medical gentlemen, to examine fifteen cases of more or less obscure urinary affections. In all I have made twenty-three separate cystoscopic examinations. I do not intend to take up the time of the Society by giving a detailed account of all these cases, but I desire to classify them under three heads, and to give a short account of one or two cases, typical of the headings under which I place them. These cases may be considered as follows:—

1. Those which from *positive vesical evidence* permitted a positive diagnosis.

2. Those in which *negative vesical evidence* gave a positive diagnosis of renal disease; and

3. Those in which the diagnosis was not furthered by the examination.

Under the *first* head, *positive vesical evidence*, I am able to group *eight cases*: two of tumour, two of cystitis, two of stone, one tubercular ulcer, and one a clot on the floor of the bladder (which probably obscured the cause of the hæmaturia).

Under the second head, negative vesical evidence, five cases. In all of these the diagnosis lay between hæmaturia vesical in origin and renal hæmaturia. In three the bladder was apparently quite healthy, as seen by the cystoscope, while in the other two cases one showed a marked rugosity of the bladder, such as would be expected in a patient who had for a long time experienced difficulty in micturition from a greatly enlarged prostate, while the other showed a unilateral limited area of rugosity around the right ureter. The latter case is interesting, as Mr Fenwick figures in his book a bladder which showed almost precisely the same condition.²

¹ The Electric Illumination of the Bladder and Urethra. 2nd edition, 1889. Hurry Fenwick, F.R.C.S.

² Fenwick, op. cit.

Under the *third head* I can place two cases, in which cystoscopic examination did nothing to throw light on the diagnosis. The former of these I propose to describe in some detail, but the other was only seen very unsatisfactorily, as during the examination, which was conducted under chloroform, the patient had a rigor, and it was deemed inadvisable to proceed further with the examination.

CASE I.—J. C., male, æt. 63, under the care of Prof. Chiene. Gave history of *intermittent hæmaturia* for several months before admission to hospital. On admission complained of pain at the point of the penis, pain above pubis and in small of back at left side. Blood in the urine, and frequency of micturition. The pain at point of penis was not constant, but came on just before micturition, and continued for some time after. Sometimes the urine was quite clear, but the blood after irregular intervals, and independently of exertion, appeared, and clots were occasionally passed. Rectal examination revealed nothing. Microscopically the urine contained pus and blood cells and triple phosphates, but no tumour cells were at any time seen. On sounding, Prof. Chiene detected a roughness on left inferior part of bladder—provisional diagnosis, a tumour.

Cystoscopic Examination.—View rather blurred, but an irregular eminence extending over an area equal to a crown piece was seen on the left inferior part of the bladder. It was not villous on the surface, and differed wholly from the rest of the bladder wall.

Diagnosis.—A sessile lobulated tumour, not villous, situate on the left infero-posterior part of the bladder wall.

Operation.—On 28th October 1889 Prof. Chiene performed lateral perineal cystotomy, but was unable to remove the tumour, which was hard to touch, lobulated, and sessile. In size very similar to idea got by cystoscopic examination.

This patient was examined cystoscopically twice without any anæsthetic, and he stated that he felt no discomfort either during or after the examination.

CASE II.—T. M., male, æt. 17, under Prof. Annandale's care. Complained of pain at point of penis especially, but also along whole urethra during micturition, frequency of mieturition, and dark discoloration of urine (blood). Illness began seven months before admission to hospital, when he felt for the first time pain at the point of penis during micturition. This pain gradually increased, and about four months before admission he observed clots of blood in his water, passed chiefly at the end of the act of micturition.

Dr Cotterill sounded this patient and detected a roughness on left inferior part of bladder, but was not satisfied that this was due to a tumour. He kindly permitted me to examine the case cystoscopically, which I did on three occasions, when I was able to recognise a rough, irregular, reddish-coloured, sessile tumour on the left infero-posterior part of the bladder. Small bloodvessels could be distinguished on its surface, and also one or two small clots lying on it. The bladder otherwise was quite normal in appearance. A satisfactory view of the whole bladder was got at each examination, and the tumour growth was seen by Drs Cotterill and Reid.

Diagnosis.—A sessile papilloma in area equal to a crown piece.

This patient suffered no discomfort during or after the examination, which was conducted without any anæsthetic.

On the 26th September Prof. Annandale performed perineal cystotomy. He found the tumour as described on cystoscopic examination, and scraped it away.

CASE III.—H. O., æt. 25, male: under Dr P. H. Maclaren's care; a soldier, served in Egypt. At Christmas 1888 he, for the first time, felt a sharp shooting pain in left side. Pain passed down into groin and left testicle, and was also felt at point of penis. A week after the pain appeared he noticed for the first time blood in the urine, but passed no clots. In September (two months ago) he passed a small stone per urethram. The sharp shooting pain left him after this, but a "nasty gnawing pain" remained in the left loin. He had hæmaturia at intervals during the six weeks immediately preceding admission. Microscopically the urine showed blood cells and a few oxalic acid crystals. Sounding gave negative results.

Cystoscopic Examination.—The bladder appeared to be quite healthy. No cystitis; no rugosity; no calculus seen or felt; ureters seen as narrow vertical slits.

On 4th November Dr Maclaren cut down on the left kidney, but failed to discover any stone either in the pelvis or substance of that organ.

Since the operation the patient has been quite free from any symptoms; no pain, no bleeding. He states that he is better than he has been for weeks previously.

CASE IV.—A. S., male, æt. 36, under care of Professor Fraser. Complained of pain in the loin and left side, and dark colour of urine (blood).

History.—In the beginning of September 1889 patient noticed that his water was darker in colour than normal, and at the same time began to feel pain in the lower part of his back and left side.

He had no pain in the penis before, during, or after micturition. The blood in the urine was continuously present, but he did not pass any clots of blood. The urine contained blood cells and oxalic acid crystals; no tube casts. The bladder was sounded by Dr James Ritchie, who felt a roughness on the left inferior aspect of the bladder.

Cystoscopic examination revealed a rugose, vascular surface around left ureter. Injected bloodvessels were seen quite distinctly on the surface of rugosities. The bladder wall otherwise seemed quite healthy. In this case there seemed nothing vesical sufficient to account for the hæmaturia. The after-history of this case seemed to show that hæmaturia was renal.

CASE V.—Mr D., male, æt. 40. Four years ago suffered from chronic cystitis, for which perineal cystotomy was performed. This relieved the pain, but frequency of micturition continued, the patient requiring to make water night and day every half hour, passing about 1 oz. of urine at a time. No enlargement of prostate; no pain on pressure over kidneys. On microscopical examination of the urine, pus and amorphous phosphates.

On sounding nothing could be felt, and the bladder seemed fairly capacious. Washing out had been used for long periods. No residual urine.

In September 1889, the patient having been anæsthetized, 6 ozs. of fluid were injected into the bladder, and a cystoscopic examination made. Shreds of mucus were floating in fluid, and some were seen adherent to bladder wall, but nothing otherwise abnormal was detected.

It may be said that of the five cases I have quoted only two had vesical disease of a definite character, and that in each of these the abnormal swelling was detected by the sound, and cystoscopic examination was therefore unnecessary; but I think that even though a definite diagnosis of tumour had been previously made, yet the cystoscopic examination was valuable—1st, as it verified the diagnosis; and, 2nd, gave a more exact idea of the nature of the tumours. But even if in these cases cystoscopic examination might have been done without, I think the following remarks by Dr Max Nitze show that it cannot be viewed as valueless in the diagnosis of all tumours of the bladder. In the *Lancet* for May 1889 he writes:—

"Finally, on comparing cystoscopic examination with other methods, it must be noted that the examination of the urine, in most cases carefully made, had only in two cases shown the presence of villous tissue. Rectal palpations, when made, had always given a negative result. Further, the examination by the sound had been made in nine cases before cystoscopic examination, and in none of these cases had the sound revealed the presence of a tumour, which in two had attained the size of a small apple, although the examination was made by most experienced surgeons and specialists."

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Then, again, Mr Hurry Fenwick,¹ who has examined very many cases cystoscopically, gives numerous examples of obscure hæmaturia, in which he was able to demonstrate satisfactorily either that the disease was vesical in origin, or that the bleeding was undoubtedly renal in its source.

In conclusion, therefore, I think we are justified in the belief that the cystoscope will prove a most valuable aid in diagnosis. Where a tumour or other vesical affection has been discovered by sounding or other examination of the patient, the cystoscope is still of value in enabling the surgeon more exactly to gauge the possibility of its removal; and in cases where the diagnosis is doubtful it may prevent diagnostic incisions, which are certainly much more dangerous to the patient than cystoscopic examination. But even if some may consider the ordinary means of examination efficient for diagnostic and prognostic purposes in the majority of obscure urinary cases, they may admit, with Sir Henry Thompson, that "although we should not give up in any respect the simple means of prosecuting diagnostic research hitherto employed, by all means keep the cystoscope in reserve for certain exceptional cases where other usual methods have been tried and have proved unsuccessful."

That the instrument may be used with safety I think has been fully proved. In none of the cases which I have examined has the patient suffered from any bad after-effects; indeed, one expressed himself to be considerably better—a belief which was probably enough correct, as the washing of the bladder incident to the examination had been very thorough.

The President thought the Society were much indebted to Dr Wallace for his lucid description of the cystoscope and the details that required to be attended to in its employment, as well as the record of the cases with which he had been able to illustrate its value. It was one of the advantages of their Society that the members were thus instructed in the technique of a new means of investigation by one who had had good opportunities of becoming more familiar with its use than the majority of them could possibly In exploration of the female bladder the cystoscope would be. probably be of more restricted application, because in most cases a slight and safe dilatation of the urethra allowed of its direct examination with the finger. In a case lately under his care in the Infirmary its use might have been of service. The patient had been in the ward some years ago suffering from hæmaturia, which was found, on introduction of the finger, to be due to villosities in the trigone and fundus of the bladder, with ulcerated spots between. Under the use of injections she recovered, and for five years was free from pain and bleeding. She returned, however, some time ago greatly reduced by recurrent hæmaturia. She had ¹ Fenwick, op. cit.

a cachectic look, and as the bladder felt thickened through the anterior fornix, he (the President) thought some malignant deposit must have taken place in the walls. She sank in spite of the use of styptics and stimulants administered internally and of astringent injections—among others, of perchloride of iron; and on postmortem examination the bladder was found only to have the morbid changes that were noted as having existed years before.

Dr Cotterill said that while Dr Wallace's interesting paper did not lend itself to discussion, he was glad to have an opportunity of testifying to the ease with which the instrument was used in the cases he had examined with Dr Wallace, and the satisfactorily definite information which was to be got by its use. He thought the Society were much indebted to Dr Wallace for having brought the cystoscope under their notice.

2. CYST OF THE POSTERIOR EXTREMITY OF THE INFERIOR TURBINATED BODY.

By REGINALD HORSLEY, M.B.

WHEREVER a glandular secreting surface exists, should there be any obstruction to the escape of the products of secretion, a cyst from retention may result, provided that the walls of the cavity be capable of enlargement, and that tension be not so great as to check secretion altogether; and since the mucous membrane lining the lower or respiratory nasal tract, and, more particularly, that covering the posterior part of the inferior turbinated body, is thickly studded with the orifices of numerous mucus-forming glands, it follows that there is no reason why retention cysts should not occur in this as well as other regions of the body.

As a matter of fact, however, while the possibility continues to exist, the actual occurrence of such cysts upon the posterior extremity of the turbinated body is so unusual and infrequent as to remain unnoticed in the standard works upon diseases of the nose. Moreover, it would seem—as far, at least, as my knowledge goes that even among observers whose works have not taken a collected form, isolated instances of this condition have not, with one exception to be presently noted, been placed upon record. This fact alone, apart from the reflex neurosis which existed along with, and as a consequence of the cyst, justifies, I think, the publication of a case which came recently under my notice.

History of the Case.—Towards the close of July 1889, Miss B., aged 50, consulted me for the first time. She complained of a sensation of dryness at the back of the throat, an occasional feeling of obstruction at the back of the nose upon the right side, and asthma, which latter affected her, as a general rule, at night. It is important to note that this feeling of obstruction was not present upon the occasion of the patient's first visit. Family and personal history were good, as was the patient's general health, with the exception that she occasionally suffered from attacks of rheumatic gout. About five years ago there was a tendency to breathlessness; but as this soon passed off, and seems to have been associated with slight gastric disturbances, it has no material or direct bearing on the present aspect of the case.

The actual starting-point of the disease seems to have been about the end of April 1889, when what was thought to be a "dry cold " was noticed. This affected particularly the posterior part of the nose, which felt, to use the patient's own words, " as if there were no moisture in it." Towards the middle of May the sensation of dryness extended to the pharynx, and about the end of the same month the patient became very nervous and fearful, owing to the fact that she constantly awoke during the night, or very early in the morning, with a sense of suffocation. This symptom went on increasing to such an extent, that at last the patient actually dreaded to go to sleep in the recumbent posture, and so began about this time the practice of sleeping propped up by pillows, whereby the symptoms were alleviated, though not entirely caused to disappear. The dryness of the pharynx and naso-pharynx, and the feeling of obstruction in the nose, were always more marked in the morning, and on this account, I suppose, the patient was advised to snuff the water she washed in up her nose. This she did, to her own intense discomfort, and so, after a time, abandoned the practice.

Throughout the day the sensation of stoppage of the nose passed off more or less, but during the months of June and July the nocturnal terrors and sudden wakings persisted, and increased in frequency and intensity, the sleep function becoming seriously disturbed by asthmatic attacks of varying force and duration. The asthma was at times so serious as to render it impossible for the patient to sleep at all. Indeed, when once awake she struggled to remain so, being afraid to drop off, lest there should be a repetition of the horrible sense of suffocation.

On examination, the pharynx was found to be somewhat congested, as were the posterior extremities of the inferior turbinated bodies, that on the right being slightly enlarged as compared with its fellow on the left side. The congestion, though most marked at the posterior extremities, was evident along the whole length of the middle and inferior turbinated bodies, more particularly on the right side; but there was no undue swelling, nor was there the slightest appearance of polypus or any other tumour. In the naso-pharynx slight but distinct symptoms of catarrh were present, and some yellowish masses of mucus could be seen adhering to the back and sides of the cavity.

The diagnosis of post-nasal catarrh passing into a chronic state, with congestion of the turbinated bodies, and some pharyngitis having been established, the patient was told to paint the pharynx and naso-pharynx with Mandl's solution—

Ŗ	Iodi, .		grs. vj.
	Potass. iodid.,		grs. xij.
	Ol. menth. pip.,		Μv.
	Glycerin.,		Zi.
	Solve and misce:	pigm	ent. ft.

Signet—To be brushed on the back of throat and behind the palate once daily for the first week, and once every other day for the second.

To relieve the congestion of the nose an alkaline wash was prescribed-

3	Sod. bicarb.,		
	Sod. bibor,	. āā	grs. vij.
	Sod. chlorid.,		
	Sacchar. alb.,		grs. xv.
	Misce :	ft. pulv.	U

Signet—One powder to be dissolved in a tumbler of warm water as a wash for the nose. To be used twice daily.

In addition to these local measures, Fellows' Syrup of Hypophosphites was prescribed as a general tonic. Should this treatment fail, I determined on the patient's return to recommend the application of the galvano-caustic point to the posterior extremities of the turbinated bodies. As it happened, however, there was no occasion to resort to this remedy.

On 19th August the patient returned, and at once mentioned, what may be stated *en passant* as an interesting fact, that after three days she had left off taking the Syrup of the Hypophosphites, as it had brought out a red rash, accompanied by uncomfortable itching upon her legs, arms, and wrists. She then asked me if the medicine contained quinine—as once before, when that drug had been prescribed, the same symptoms had appeared. Shortly after discontinuing the medicine the rash subsided. The action of quinine is reported to have been "occasionally attended by the appearance of an eruption on the skin" (Bartholow), and this instance is interesting as bearing out the statement.

The patient further stated that the dryness in the throat was much relieved, but that at times the feeling of obstruction became absolute upon the right side; this was the case during the visit. Further, the asthmatic attacks had increased in severity, the previous night being described as "a fearful one."

On examination, the pharynx was found to have recovered its normal appearance, the naso-pharynx also looking healthy and showing no trace of hypersecretion. On the posterior extremity of the right inferior turbinated body, however, appeared a sessile tumour, which looked extremely like a mucous polypus. Globular in shape as far as could be noted, pale in colour, and with no appearance of vascularity, the tumour, as shown in the illustration,



extended upwards so high as to block almost entirely the middle, and completely the inferior meatus. Inferiorly and posteriorly it projected somewhat into the naso-pharynx, while interiorly it impinged upon the middle and lower thirds of the septum. The surface of the swelling was granular. The sudden appearance of a tumour in a position where three weeks before none had existed, as well as the size it had attained in that time, excluded the idea of a mucous polypus, and a

digital examination seemed to be the best way of accurately gauging the nature, extent, and exact attachment of the growth.

On introducing the finger into the naso-pharynx, the tumour was felt to be circumscribed, of uniform soft consistence, and slightly resilient to the touch. Gentle pressure caused expansion in all directions, and the diagnosis arrived at was, that the tumour was probably a cyst containing fluid. This was suddenly verified a moment later, for the tumour gave way under the touch. The result was surprising. There was a simultaneous discharge of clear, slightly blood-stained fluid through the nostril and into the back of the throat: the patient expectorated into her handkerchief a few shreds of membrane, and declared herself well. The relief was instantaneous, and the disappearance of the cyst complete; for on subsequent examination with the rhinoscope no evidence of its existence remained, save a slight excoriation of the somewhat swollen extremity of the inferior turbinated body, where the finger nail had come in contact with the mucous membrane. After this very satisfactory, if somewhat unexpected result, Mandl's solution was applied to the site of the cyst, and a course of the same prescribed for the following fortnight. At the end of this time the patient returned, perfectly free from nasal obstruction. The catarrhal state of the pharynx and naso-pharynx had entirely disappeared, and there had been absolutely no recurrence of the asthmatic paroxysms. Since that time, and up to the date of publication, the patient has remained perfectly well.

It would be interesting to know what was the condition of the patient's nose prior to her first visit. The asthma undoubtedly existed, but the same cannot be said of the cyst, which formed in the interval between the first and second visits. The post-nasal catarrh and the congestion of the turbinated bodies would be quite enough, under certain circumstances, to account for the asthma; but, at the same time, it is possible that, before I saw the patient, a cyst had formed and disappeared, causing during its persistency the sensations described by her; while the serious aggravation of symptoms which occurred before her return for the second time was due to the formation of another cyst of most probably larger dimensions than its predecessor. The probability of the existence and spontaneous evacuation of a former cyst is heightened by the fact, which I omitted to mention before, that the patient stated that, some time before her first visit, she had experienced the sensation of "something giving way at the back of her nose," which sensation was followed by some abatement in the severity of the symptoms.

As regards the asthma itself, the fact of its disappearance after the operation is evidence enough of its reflex origin. Into the large question of nasal reflex neurosis I do not intend to enter, but I think it will be admitted that this case affords a typical example of such neurosis starting from a diseased spot in the nose, accurately defined to be, in the present instance, the posterior extremity of the inferior turbinated body.

But while not going deeply into the subject of nasal reflexes, nor committing myself to an adherence to any hypothesis in connexion with them, I may be permitted to state two views which are advanced to explain how, given a diseased area in the nose, and a neurotic subject—a constitutional state insisted on as essential by the great mass of authorities—the asthmatic paroxysm may be generated.

Of the one view, Sajous gives such an admirably succinct account that the passage may well be quoted in its entirety. He says, "The respiratory region which includes all the surfaces below the olfactory, is under the control of vaso-motor nerves of the sympathetic system, and is exceedingly sensitive to local or peripheral irritating causes. This sensitiveness, however, does not reside in the vaso-motor supply, which is only a secondary factor in the production of turgescence, but in the terminal filaments of the sensory nerves distributed over the surface of the membrane. Commencing with the posterior area, we find that the membrane of that location is supplied by several branches of the spheno-palatine ganglion, which enter the back part of the nasal fossa by the spheno-palatine foramen. Besides its motor and sensory roots, the spheno-palatine ganglion possesses a sympathetic root, which is derived from the carotid plexus through the vidian, thus forming a well-defined connecting link between the nasal membrane and the sympathetic system.

"In the production of the reflex symptoms peculiar to the posterior area, cough and asthma, the impression is consequently transmitted from the posterior end of the inferior turbinated bone, or the corresponding portion of the septum, to the spheno-palatine ganglion; from that to the carotid plexus, which is closely connected with the posterior pulmonary plexus, formed not only by the branches of the sympathetic, but also by some from the pneumogastric, and finally to the ramifications of the air tubes through the ultimate filaments of the former, which are lost in the bronchial mucous lining."

As the spheno-palatine ganglion thus unites so closely the nasal and respiratory tracts, it follows, accepting the above statement as correct, that the irritation caused by the pressure of the cyst upon the septum, being transmitted along the course described, was able to set up the train of symptoms already mentioned.

As the exponent of another view, I shall quote Dr M'Bride, whose opinions are given in the January number of the British Medical Journal for 1887. If I understand the matter aright, Dr M'Bride predicates the existence of a certain centre which may under some circumstances be rendered unstable by irritation originating in the nose. Briefly put, this view is expressed as follows :- "I have admitted that, in a certain proportion of cases, nasal disease is the actual factor in the production of certain neuroses, and, for simplicity's sake, I shall take, as an example. The meaning of this admission is that I believe that, asthma. under certain circumstances, a stimulus carried along the filaments of the fifth nerve which supply the nares, may, by overflow, reach the area corresponding to a certain centre, and there set up a molecular change which results in the symptoms of bronchial asthma. Observe that the very admission that there exists a form of asthma which owes its origin to nasal disease carries with it the admission that stimulation of the nasal nerves may cause stimulative, or, what is probably the same thing, molecular changes in the 'asthmatic centre,' if I may be allowed the term. If, then, this centre be in a state of what we may call stable equilibrium, it is conceivable that irritation of the nose may make it unstable." Dr M'Bride, however, goes further, and argues conversely that if this centre be unstable, "it is also conceivable that stimulating the nasal mucous membrane may, by inducing a changed molecular condition, render it stable." And therefore "cauterization of the nasal mucous membrane may prove useful in certain cases of asthma due to central nervous causes."

Whatever the mode of transmission, the neurotic constitution seems to be necessary to the existence of the capacity for such a reflex, if I may put it so; but in this connexion Joal of Mont Dore states that nasal reflexes are principally developed in arthritic individuals, and it will be remembered that the patient whose case has been described showed evidence of the gouty constitution.

Interesting though it would be to quote other examples of the formation of cysts in the region under consideration, information on the subject is, as I have said above, either non-existent or excessively difficult of access. Such authorities as Voltolini, Schech, Moldenhauer, and Sajous are practically silent on the subject, referring in merely general terms to the occurrence of cysts in the process of post-nasal catarrh, or more especially to their development in the pharyngeal bursa of Luschka. Dr M'Bride, in whose department in the Royal Infirmary it is my privilege to work, agrees in admitting the exceeding rarity of the condition, and states that in his extensive practice he has never yet met with it. At the same time, he has been good enough to give me details of a case which came under his observation, and which affords an example of a cyst, apparently in connexion with the turbinated bodies, though the position and circumstances attending the growth were different to those in my own case.

Two years before he consulted Dr M'Bride, the patient noticed a swelling just outside of and under the right *ala nasi*. When Dr M'Bride saw the patient the tumour was manifest in the position noted, being covered with distended veins which coursed over its surface. The mouth was normal, but examination of the anterior nares showed marked bulging under the right inferior turbinated body, almost conveying the impression of a second bone in that region. To the touch the tumour was elastic, and fluctuation was readily detected. An exploratory puncture allowed much serum, tinged with blood, to escape; but next day, the cyst having refilled, presented the same appearance as before. Evacuation was again practised, and it was intended to inject iodine or some other irritant, but, as the patient did not return, it is probable that the cyst did not again refill.

Voltolini, speaking of affections of the pharyngeal bursa, mentions the occurrence of cysts in that organ; and Tornwaldt of Dantzig calls attention to the same phenomenon. Moldenhauer, too, briefly observes that in the course of chronic post-nasal catarrh cystic growths may occur; while Sajous devotes but a few lines to the condition—adding, however, the information that the removal of these cysts is not followed by recurrence.

The only case, as far as I can discover, which at all resembles the one I have described is that recorded by Dr George Johnson of London. In the first instance, I am indebted to Dr M'Bride for telling me of this case; and in the second, to Dr Johnson himself. who, when I wrote to him on the subject, most kindly sent me a reprint of certain articles which appeared in the Lancet for 1864, and which contained an account of a case of cyst of the posterior extremity of the middle turbinated body. In Dr Johnson's case the obstruction was complete, the right nostril being altogether occluded posteriorly, though matters had occupied two years in reaching this pass. The exciting cause was an ordinary cold in the head, which is described as severe, and which possibly originated a post-nasal catarrh, though when Dr Johnson first saw the case the surrounding parts were found to be healthy. As in my case, the diagnosis was verified by the removal of the tumour, which, however, was not effected in the same way. Mr John

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Wood, a then colleague of Dr Johnson, introduced a slim curved forceps through the anterior nares. On grasping the tumour, and drawing it forward, it suddenly collapsed, allowing a quantity of glairy fluid like white of egg to escape, and the diagnosis of a cyst was thus established. Here, too, the destruction of the tumour was followed by instant, absolute, and permanent relief of all disagreeable sensations, which in the case of Dr Johnson's patient seem to have been local, and limited to the affected area.

Such an enormous amount of proof has accumulated to show that asthma not infrequently takes origin in diseased states of the nose that I should have hesitated to add another item, were it not for the interesting pathological state which acted as the cause in the case of Miss B.,—a state interesting enough on account of its effect upon the patient on the one hand, and the rarity of its occurrence on the other.

The drawing of the cyst was made for me partly from Nature, partly from description, by Mr James Bayne.

Note.—Since the above was written, I have received a copy of the *Philadelphia Medical Times*, in which Dr Carl Seiler speaks of cystic polypi in the upper air passages. The author remarks upon the rarity of this condition, stating that "besides the one recorded by Dr Lefferts, one other case only is reported in the literature on the subject." Dr Seiler further remarks, that he has met with four cases, of one of which—cystic degeneration occurring in a fibrous polypus—he gives a condensed account.

I regret that I have been unable to obtain the published account of Dr Lefferts' case.

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Dr Hunter recalled a case which occurred many years ago in his practice before laryngoscopy was much employed, and where a young lady suffered from a cystic tumour in the post-nasal space, which was dependent behind the soft palate, burst spontaneously, and afterwards gave no further trouble.

Dr Cotterill remarked that while credit was certainly due to Dr Horsley for the account he had given the Society of this rare growth, it was possible that cysts of this nature were not really so uncommon in this locality as Dr Horsley's paper might be supposed to infer. Mr Cotterill was sure that all surgeons who had any considerable experience in operating on so-called cases of mucous polypus of the nose could call to mind many cases in which the tumour, on the slightest touch of the forceps, collapsed entirely with a discharge of glairy fluid from the nostril and an absolute relief of the symptom of obstruction of the nares. Mucous cysts were common in the mouth, and there appeared to be no anatomical reason why they should not be so in connexion with the turbinated bones. Mr Cotterill believed, therefore, that the condition was not so rare as Dr Horsley's paper had suggested, and that they had been hitherto not unfrequently mistaken for the softer forms of mucous polypus.

Dr Horsley replying, said he had omitted to state that the patient described a sensation of something giving way at the back of her nose previous to her first visit. This sensation was followed by some relief of the asthmatic paroxysms. Probably spontaneous evacuation of the cyst, as described by Dr Hunter, occurred at this time. After this, the cyst either refilled or a new one formed. Dr Cotterill supposed these tumours were not so uncommon as was believed. He (Dr Horsley) contended that the condition was rare of description rather than of occurrence. But, while admitting the occasional extreme tenuity of mucous polypi, not only was this position a somewhat unusual one for their growth, but they were slow growing, whereas the tumour under discussion occupied only a fortnight in reaching its completion. Cysts might frequently occur in this region. He had no doubt it was so; his contention was that they had not been frequently described.

3. ON SOME POINTS IN THE TECHNIQUE OF LAPAROTOMY.

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THERE are various reasons which weigh with me in venturing to bring the subject of "The Technique of Laparotomy" before the Medico-Chirurgical Society. All my communications on this and cognate subjects have been hitherto read and discussed in the sister Society of Obstetrics. If any justification for my procedure were necessary, I could point to the pleasing fact that your presidential chair is this year occupied by the Professor of Obstetrics; and I cannot let this opportunity pass without acknowledging, however inadequately, his kindness to me during my whole professional life, which has imposed upon me a debt of gratitude which I neither hope nor wish to reduce. My main reason, however, is that laparotomy, so far at least as the female pelvis is concerned, has fallen into the hands of gynæcologists; and I confess that I can find no fault with this arrangement. Nor do I think that any argument can be urged against the propriety of it; for, after all, the decision as to the propriety of an operation must lie with those most commonly brought in contact with the organs involved.

Although I do not profess to be able to add anything new to the mass of literature on this subject that at present exists, yet it appears to me that an interchange of opinion, between surgeons well accustomed to laparotomy and those of us who view it from the more purely gynæcological standpoint, may be of mutual benefit. My experience is derived from 200 cases, which have afforded me an opportunity of seeing and dealing with most of the accidents and varieties of the operation. With regard to the question of statistics, this I have dealt with separately in other communications, but the following table briefly states the facts :--

Ovariotomy and appendage case Exploratory incisions, with deat at long intervals from prima	es, 166 chs ury	Deaths. 7	Mortality per cent. 4·2
disease,	20	9	45
Incomplete operations, .	4	1	25
Hysterectomy,	4	4	100
Umbilical hernia,	1		
Tubercular peritonitis,	. 3		
Purulent peritonitis,	2		

Without summarily dismissing the question of diagnosis, I must

say that increasing experience has not, to me, lessened its difficulties and uncertainties. Although the diagnosis of ordinary ovarian and fibroid tumours is as a rule simple and easy enough, yet there remains quite a large class of cases where accuracy of diagnosis is, so far as I know, unattainable before the abdomen is opened.

Encysted Tubercular Peritonitis .- Take, for instance, the cases of encysted tubercular peritonitis, of which I have met with three. Between these conditions and a simple ovarian tumour, I know of no means whatever of diagnosing. The physical signs, even to the clear percussion note in the flanks, are the same. There is, as a rule, no history of peritonitis, and in those cases, at least, which I have seen there had been no indications of tubercular disease before operation, though in two tuberculosis in the lungs or elsewhere developed afterwards. In respect of this question of tubercular peritonitis, I may say in passing that there can be no doubt that, where the other organs in the body are unaffected, washing out and draining often effects a cure. In other cases the mere interference with the peritoneum seems to be the only stimulus wanted for the rapid development of tubercular disease elsewhere. I may here be permitted to point out, so far as I know, the precise position in which laparotomy, with regard to tubercular peritonitis, at present stands. The investigations of Spaeth corroborated by others, as well as my own, over a field including in all seventy cases, show the following conclusions :---

1. In primary tuberculosis of the peritoneum, where none of the viscera are involved, laparotomy is often, though not always, a curative measure.

2. When the pelvic organs are affected, operative interference is not usually successful.

3. If the disease originate in the intestine, operative interference is simply palliative.

4. When the genital tract is the primary seat of infection, operation should be performed as soon as possible.

5. Wherever pus, be it from tubercular disease or otherwise, has accumulated in the peritoneum, abdominal section gives brilliant results. There are no cases of abdominal section that are more satisfactory than those of pelvi-abdominal abscess.

Sarcoma of Mesentery.—Take another illustration, viz., a case where there was a firm, semisolid mass about the size of a cocoanut in the pouch of Douglas, with the uterus displaced forwards, the discomfort complained of being backache and irregular menstruation. The physical examination seemed to leave little doubt that this was an ovarian tumour. Laparotomy, however, revealed a large sarcomatous group of mesenteric glands connected with the caput eæcum coli, lying deep down and distending the pouch of Donglas: operative interference in such a case was, of course, impossible.

Solid Ovarian Tumour.-Again, let me refer to quite a recent

case—a woman sent into the Hospital with a large solid tumour the size of a six months' pregnancy. There was a history of menorrhagia and metrorrhagia, which had continued with increasing severity. The sound showed the uterus very considerably enlarged, and its introduction caused copious hæmorrhage. I diagnosed, therefore, a fibroid tumour, and advised removal of the ovaries. On opening the abdomen I found instead of a fibroid a solid ovarian tumour firmly wedged down in the pelvis. This I removed satisfactorily. The physician who sent the case to me made the remark in his letter, "Is not this just the case for electricity?" I can only repeat the question, and the issue gives the answer.

Large Sarcoma of Liver.—Perhaps the last is the most striking of all. This patient was sent to me with a large abdominal swelling, which could be plainly felt rising from the pelvic brim and reaching apparently to the costal margin above. A per vaginam examination showed the uterus free, and a smooth even mass lying within the pouch of Douglas. A careful physical examination by others as well as by myself did not warrant the assumption that the tumour had done otherwise than rise from the pelvis. You will probably therefore sympathize both in my surprise and in my disappointment when, on opening the abdomen, I found not the removable tumour I had expected, but a huge sarcomatous *liver* filling up the entire abdomen, and passing right through the pelvic brim into the pouch of Douglas.

With regard to exactitude in the diagnosis of appendage conditions, the difficulty is still greater; and with all the care one can bestow on a previous examination, it is still a fact that many of these conditions are not accurately diagnosed until the abdomen is actually opened.

In respect of the relation of menstruation and the period of operating, I do not think there is very much to be said, beyond this—

1. There is no possible objection to operating when the patient is menstruating, because then the organs dealt with are being depleted; nor

2. Is there any objection to selecting any intervening period; but

3. So far as my experience goes, it is unwise to operate when menstruation is imminent; for in two such cases where ovariotomy was performed for parovarian tumours of the right side, within forty-eight hours following the operation there was distinct hæmatoma of the corresponding ovary, which very materially delayed the convalescence, and, in one of the cases at least, rendered abdominal section for the second time necessary in the same patient.

If it be necessary to operate while the patient is menstruating, I take care that an antiseptic vaginal douche be freely administered immediately before the operation, and that the diapers are made of antiseptic absorbent wool.

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First, then, with regard to the immediate preparations for the operation. There are but three requisites—an empty bladder, an empty intestinal tube, and a clean skin. I still insist upon the necessity of freeing the pubes of hair. This in many cases, no doubt, is a work of supererogation, but, considering the little care common women take of these parts, I think it best to remove any possibility of doubt. To ensure absolute cleanliness of the skin, three washings, I think, are essential. The first with ordinary soap and water; the second with turpentine; the third with solution of corrosive sublimate, very special care being taken with regard to the umbilicus.

On the threshold of the subject we are met by the question of antiseptics. It may seem strange that here in Edinburgh any such question should arise, and I do not presume for one moment to discuss the general question of antiseptics, but to show how the matter stands so far as I am concerned in the performance of laparotomy.

My earlier operations were all performed with what is known as strict antiseptic precautions, *i.e.*, the spray, etc. I have never yet seen my way to abandon altogether antiseptics of some kind or other, but I now employ them in a very modified form, my main care being with regard to clean hands and sponges. I still use a weak solution of perchloride of mercury (so'so) to irrigate the abdominal cavity, and to apply, as a precautionary measure, on the towels surrounding the patient; and I confess that I can see no reason why I should abandon these measures, which are perfectly harmless, and probably afford an additional element of safety to the operation. So far as I am able to judge, Tait, Bantock, and others have discarded the use of all antiseptic solutions of any kind whatever, just because they found them neither a safeguard nor harmless. They affirm that both their temperature and their death-rate have been diminished since they have given up the use of these drugs. Be their experience what it may, up till this moment I have not been able to point to a single case save one, where I could connect in the most remote manner the cause of the death or the rise in temperature with the use of any antiseptic. In the case to which I refer, the patient exhibited some of the symptoms of mercurial poisoning, this being due to the accidental use of too strong a solution of bichloride of mercury.

Further, my death-rate for ovariotomy and appendage work stands at present at 4.2 per cent.—in other words, out of 166 operations on cases of this class, there have been 7 deaths, in which the cause of death has been :—Fatty heart in 2; ulcer of the stomach in 1; exhaustion in an old woman of 70, 1; shock, 2; exhaustion from suppuration, 1,—total 7.

A further reason that must always weigh with those of us who practise both obstetrics and gynæcology is this, that however much we may minimise the value of antiseptics in general surgery, not their most bitter opponent but must admit their paramount importance in obstetrics. I do not fear contradiction when I say, that their introduction into this department has been the most important practical improvement in obstetrics since the introduction of the forceps.

Hence, therefore, a little latitude must be conceded to those of us who practise both departments, if we still continue to use modified Listerism in abdominal work, notwithstanding the brilliant results of Tait and Bantock without any antiseptics at all.

Judging from my own experience, I do not think either the adoption of strict antiseptics or their abandonment to the limited extent to which I employ them now has made the slightest alteration in my results. I am quite sure of this, that absolute eleanliness in regard to sponges and hands, and the patient's skin and surroundings, are all that are essential to a safe laparotomy as far as sepsis is concerned. But as absolute cleanliness on the part of the patient, assistants, and nurses is not always to be relied on, the employment of modified antiseptics supplies the necessary safeguard.

As to the selection of the anæsthetic, during the earlier operations I invariably used chloroform; but owing to the long persistent sickness, sometimes lasting from thirty-six to fortyeight hours, and even longer, following its use, I was obliged to abandon it. My decision was precipitated owing to one patient to whom chloroform was administered for two hours, and who died after five days' persistent vomiting, with no apparent cause for death except the exhaustion produced by the sickness. Ether. administered through the Clover apparatus, entirely obviates this. It has, of course, slight corresponding disadvantages-first, the necessity for an apparatus; second, the length of time taken to produce anæsthesia ; and, third, the unpleasant sensations produced by the first few whiffs. All these difficulties, however, can be overcome by starting the administration of the anæsthetic with chloroform. A more serious objection to its use is the irritation which it causes in the respiratory tract afterwards, and the utter impossibility of giving it where there is any broncho-pneumonic condition. Careful attention to the temperature of the respired air will reduce this danger to a minimum. In these latter cases, of course, chloroform is to be used.

Owing to the length of time which many of these operations take, and the uncertainty with regard to all of them, it is always best to give a full stimulant before beginning.

After the induction of anæsthesia and the arrangement of the patient on the operating-table, the abdomen, except at the point of incision, is to be covered with macintosh and towels wrung out of hot corrosive solution. In respect of the point of incision, it is apparently a disputed question as to whether it is better in all cases to select the linea alba or make the incision to

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one or other side as the position of the tumour may indicate. It seems to me that the linea alba is the most convenient spot for all abdominal and pelvic operations. It is the central spot from which it is most convenient to work, and the relation of all neighbouring tissues is best estimated from that point.

Although my own experience does not warrant me in saying so, yet I can, à priori, understand that the size of the wound may have something to do both with sepsis and subsequent hernia. Personally, I have not found that the size of the wound makes the slightest difference. Perhaps it may be quite the other way, and that a small wound causing the pressure to be confined to a limited space tends more to the production of ventral hernia than a larger wound. Certainly the only two herniæ that have occurred to me in these 200 cases have both been in women, in whom the incision was only big enough to admit of my first and second fingers. It seems to me that the size of the incision is to be regulated solely by a consideration of the accuracy with which the parts may be manipulated, and with due regard to the control of hæmorrhage and the management of complications. In other words, so far as I am able to judge, I think a big wound, with careful inspection and comparatively little oozing, is better than a small wound and uncertainty with regard to bleeding points, etc. The bearing of this question on the subsequent healing of the wound will be noticed further on.

In making the incision it seems desirable to avoid cutting through the muscle as far as possible, and rather to endeavour to separate the two recti by means of the finger nail and knife handle. This remark applies to those cases where there is no abdominal distension; for where the abdomen is distended by a large ovarian tumour, the muscular fibres are so separated as to render either their division or separation uncalled for.

Next after reaching the tumour surface, comes the question of adhesions. Of course, large adherent ovarian tumours are now much less common than they used to be, their early recognition and prompt treatment being now well known through the whole profession. Only where vessels in the omentum and mesentery are large is there any necessity for ligature. All other adhesions, whether to the parietes, intestines, or other organs, seem far best treated simply with the finger or the finger nail or a sponge. It is a waste of time and patience, and but a very slight diminution in the amount of blood lost, to deal with adhesions separately. I have repeatedly operated when the patient's temperature was 103° and acute peritonitis was going on. In such cases the adhesions are extensive and recent; and the best method, it seems to me, is to separate them rapidly with the hand and control the after-hæmorrhage, which is always profuse, entirely by hot water. Any other mode of procedure involves the loss of valuable time both to the operator and to the patient.

The most troublesome adhesions are those with the intestines,

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when sponge and finger nail are the only satisfactory means of separation. If, after separation, the intestine is very vascular, before dropping the torn portion out of sight, a little perchloride of iron or tincture of iodine applied to the spot controls the oozing, and never, so far as I have seen, has any bad effect. Even in those tumours which are entirely surrounded by intestine adherent to them, a little time and care will overcome even the most complete adhesions and leave the bowel uninjured. I have never found that any good is to be gained by waiting till a peritonitis has subsided. On the contrary, I think the peritoneum is just as safely dealt with when a temperature of say 103° indicates acute inflammation as under any other circumstances.

The oozing from parietal and visceral adhesions has never but once given me secondary trouble. All such hæmorrhage has been, with this exception, completely and permanently stopped in one of three ways—first, by filling the abdomen with antiseptic hot water, and leaving it so for some minutes; or, second, by packing the abdomen with hot sponges for some minutes; or, third, by painting any rough surfaces with a styptic such as turpentine. But, after all, a little blood left in the abdominal cavity more or less does little harm, and is quickly absorbed.

In only one case—that which I have just referred to—the abdomen became distended twenty-four hours after operation, and as the patient showed symptoms of internal hæmorrhage, and as during the operation there had been numerous and very vascular adhesions, I reopened the abdomen and washed her out with very hot water, to which I added a slightly saline solution, and then closed the wound. The patient made an excellent recovery. I have never met with one single death from uncontrolled hæmorrhage from adhesions, nor, for that part, from any form of hæmorrhage whatever.

Some of the most troublesome adhesions are those associated with tumours in the pouch of Douglas. These, of course, can be dealt with only by touch and by the finger alone. In that position they are often very adherent, and considerable violence is required to dislodge the tumour. But even there the hæmorrhage from such a cause can be perfectly well controlled by firm packing with sponges. Some adhesions in the pouch of Douglas are very firm and strong, and in raising the tumour considerable accidental tears take place, and the subsequent hæmorrhage is often very profuse. Even in such cases the bleeding vessel can with care and time be secured. In such a case, if sponges fail, then a careful inspection should be made by reflected light, and the bleeding point exposed and secured. If both these fail, then the abdominal wound should without delay be enlarged and *eventration* performed, the intestincs being carefully secured in

a warm towel. In this way space is gained, and the source of the hæmorrhage ascertained and stopped, with but little additional risk to the patient. I have not found that eventration in itself is a dangerous proceeding; but I have found that in some of those cases where recourse has been had to it the abdominal wound has shown . a disinclination to heal. This I attribute, not to the enlargement of the wound nor the removal and exposure of the intestines themselves, but to this fact, viz., that when vessels readily tear in that situation, it seems an indication of a general cachectic and diseased state of the patient; for it is quite extraordinary how much pulling and dragging in that neighbourhood the tissues will withstand in an otherwise healthy woman. In one case of gonorrheal ovaritis, for example, where the patient was much reduced, where not more than the ordinary force was used to liberate the appendages, the laceration in the broad ligaments was so great and the hæmorrhage so profuse that to secure the bleeding points I was obliged to eventrate. From the eventration itself, and from the removal of the appendages, she quite recovered, and lived for three weeks, but died directly from exhaustion due to an unhealed abdominal wound.

With very few exceptions, the pedicle in all my cases has been treated by either the Staffordshire or Bantock knot,—except, of course, in the cases of hysterectomy. In every ordinary case the pedicle, thus managed, has given good results. Twice only has the ligature slipped. In both of these cases the pedicle was broad and short. In the one the accident was observed before closing the abdomen, and the pedicle seized, clamped, and cauterized. In the other, the condition of the patient an hour after operation and the distension of her abdomen sufficiently indicated hæmorrhage. I therefore reopened the abdomen, put a fresh Staffordshire knot over the pedicle, and three extra stitches. Both patients did well.

There is a distinct class of cases, however, in which this treatment of the pedicle is inapplicable; and three alternatives, of all of which I have had experience, present themselves:—

1. In cases where, in removing the appendages for bleeding fibroids, it is found that the broad ligaments have been so split up as to render the ovary and tube almost sessile on the uterus. Then, by rotating the uterus so that the broad ligament comes into the wound, the clamp and cautery can be used with great advantage. These cases are rare; but when they do occur, as dire experience has taught me, it is unwise to trust to the Staffordshire knot. In the case I refer to, after having rotated the uterus round so that the ovary and tube with the broad ligament lay in the axis of the wound, I applied the Staffordshire knot. Immediately thereafter the uterus whisked round, and in a few minutes copious bleeding took place. I again rotated the uterus, exposed the pedicle, found the knot had slipped, and, as there was no room for any further application of the ligature, I clamped and cauterized with the best results.

2. It is distinctly indicative of the progress of abdominal surgery that it should be necessary in a communication like the present to note, as of a curiosity, that in some exceptional cases I have been obliged to treat the pedicle extraperitoneally. These cases have been six in number, and have been as follows:—

(1.) One in which I had to remove both ovarian tumour and uterus.

(2.) Two in which the pedicle was so short that I was obliged to have a portion of the tumour as a stump.

(3.) Two in which I was unable to control the hæmorrhage, notwithstanding numerous ligatures; and,

(4.) One incomplete operation.

The first five cases did well; the last died. This brings us to the third alternative, viz.:--

3. The treatment of thick pedicles by means of numerous ligatures. In such cases I have had recourse to various methods.

(1.) By placing a distinct ligature round the pedicle before transfixing, and then transfixing and amputating. Here let it be noted that the tighter the ligature is drawn the safer the patient. The ligature ought to be drawn to the full extent of the operator's power.

(2.) I have transfixed and tied the pedicle in two parts, and then afterwards applied the ordinary Staffordshire knot; and, lastly,

(3.) After applying the Staffordshire knot and removing the tumour I have sewn the peritoneal edges together with many catgut stitches.

In tying the pedicle the greatest possible care must be used in the selection of the cord, which should be No. 6 best twisted silk. It ought to be boiled before using; and there is one practical point, viz., that the same boiled cord should not be used twice. If so, it will unquestionably break. This has occurred to me once, where it broke four or five times, and ultimately the pedicle had to be secured by a doubled cord.

Once it has been my misfortune, from want of care in dealing with a large tumour, to have the pedicle tear at its root before the ligature could be applied. This, tearing as it did the broad ligament and its contained vessels, caused delay of at least an hour in an otherwise easy operation before the torn surface could be exposed and sewn.

It is certainly remarkable how easily the pedicle shrinks where the tissue involved is the broad ligament, and how different it is where uterine tissue is being dealt with. The tighter the ligature is drawn the better.

My own experience of the drainage-tube is comparatively slight. I am unable to lavish upon it the unconditional encomiums which many are in the habit of employing. That in some cases I found it act as a sort of sentinel at the wound end I am willing to

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admit; but in the majority of cases, after careful washing, its use has been to me superfluous. Let me distinctly explain that I am keenly alive to its great value in cases, for example,

Of suppurative peritonitis, and

Of tubercular peritonitis;

yet, so far as my knowledge goes, its use and scope in laparotomy is limited. In the great majority of my cases I have trusted to the absorbent power of the peritoneum to get rid of any blood debris or serous fluid, and I have invariably been justified in this confidence. Except in extreme cases, or in conditions similar to those I have just specified, the drainage-tube adds to rather than diminishes the risk.

I am sure there is no more important proceeding in the performance of laparotomy than careful subsequent irrigation of the abdominal and pelvic cavity. This, though not absolutely essential in the simplest cases, yet seems to me so important that I adopt it almost as a matter of routine. Certainly in every case where there has been much manipulation, any hæmorrhage, any rupture of the tumour, any handling of the intestines, any separation of adhesions, irrigation is an essential. I know that cases have been recorded were the patient has succumbed from shock during this manœuvre. The opponents of antisepticism say the shock was due not to the hot water, but to the antiseptic used. My own experience has been entirely free from any such accident. A weak corrosive solution, 1-5000th, with a temperature of about 115° to 120° Fahrenheit, according to circumstances, is used. The whole cavity should be flushed by means of an indiarubber tube carried deep down into the pelvis, and this should be continued till there is no trace of clot debris or hæmorrhage. The eavity is, of course, to be well sponged out. And though at first I was careful to remove the last drop of fluid, yet now I am disposed to think that the continued sponging in no way benefits the parts, and that a residuum of fluid does no harm.

Mr Caird expressed the great pleasure which he had in congratulating Dr Croom on the pre-eminently satisfactory nature of the results he had obtained in his laparotomies. It was of interest to note that the methods of which the abdominal surgeon availed himself were in a manner the reflection of the history of progress; for while he generally used the ligature and dropped the pedicle, closing the wound every now and then, he had occasionally to fall back on the use of drainage-tube, clamp, and cautery, etc. In regard to matters of technique, he would like to know if Dr Croom had employed Trendelenburg's position of raised pelvis—and with what result. Dr Croom had touched lightly on the subject of antiseptics. Some few gentlemen were prone to belittle the advantage of such aids, and he would like to know if those who disclaimed antiseptics boiled or purified their pedicle or ligature silk in any way, or used it raw. It should not be forgotten that Lister himself had indicated that the peritoneum, a huge lymph sac, was peculiarly fitted for absorption, and even differed from the other portions of the body in that it drained itself, and that in the hands of skilled ovariotomists antiseptics would not effect such a change in the mortality as elsewhere. He (Mr Caird) thought that Keith had referred to this topic in one of his papers.

Dr Brewis rose to express his admiration of the valuable paper which had just been read. Abdominal surgeons, and especially the more successful among them, had not been in the habit of giving to the world the details of their technique. In describing their cases they elaborated the difficulties met with, but did not explain how these difficulties were overcome. So that the beginner learned little from those who were most competent to teach, but had to learn by experience for himself, too often at the expense of the patient, how to surmount difficulties. There were, however, some leading operators who were exempt from this omission, and Dr Croom was one of them. He was mindful that he was a teacher as well as an operator, and as soon as he had acquired the experience necessary to impart instruction on the technique of laparotomy, he had come forward to give them the result of his experience and his opinion as to how the details of laparotomy should be carried out. For that kindness the Society, and many others outside of it, were under a deep debt of gratitude to him. Dr Croom's results had been so remarkably successful, that his technique could lend itself to adverse criticism. Every abdominal surgeon, while recognising and paying heed to leading principles, differed somewhat from every other surgeon in the details of his technique. He sooner or later drifted into a routine of procedure which was more or less his ownonly changing his procedure from time to time as exigencies arose. There was no one fixed technique essential to success, as operators following different methods had equal success. Dr Brewis's technique only differed in some few particulars from Dr Croom's. First, with regard to antiseptics, Dr Brewis formerly used a weak solution of carbolic acid for sponges and instruments, but as he had one or two cases suspicious of, and one case where there undoubtedly was carbolic acid poisoning, he modified his procedure to the extent, that during the operation he only used hot water; but previous to the operation the room, instruments, and sponges were thoroughly disinfected with carbolic acid. The latter were kept in carbolic solution, but on the day previous to an operation were removed from it, and repeatedly washed in water to get rid of the antiseptic. Since he followed this plan he had had no reason to regret it. There had been almost an absence of constitutional disturbance. and there had been no sepsis. The anæsthetic Dr Brewis used was a mixture of ether and chloroform, one part of the former to two of the latter. It was given in a Clover's inhaler. The advantages claimed for this combination were that anæsthesia was rapidly produced, and a small quantity only was used-about 2 oz. in an operation of an hour's duration. Dr Brewis carried the ligature through the pedicle with a pair of blunt sinus forceps. This he considered was better than a sharp needle, which was apt to pierce a bloodvessel and give rise to a collection of blood between the layers of the broad ligament. He preferred, like Dr Croom, the Staffordshire knot, but as an additional security, he ran a continuous suture of fine silk through the cut edge of the pedicle. In cases where the Staffordshire knot was not suitable he followed any method which he found to make the pedicle secure, remembering that it did not matter how the pedicle was tied as long as it was securely tied. Dr Brewis's practice with regard to drainage differed considerably from Dr Croom's, in that he (Dr Brewis) used the drainage-tube more frequently. While recognising the fact that the peritoneum had great absorptive powers, he was of opinion that absorption greatly depended on the inherent vitality of the patient, and that while in one patient blood and serum might be readily absorbed, in another the faculty might be almost absent, and fluids left in the peritoneum might become septic and lead to septic peritonitis. Dr Brewis drained in every case where the sponges did not come up dry to the surface. By following this plan the operation could be brought more speedily to a close; and if after a few hours the dressing was found dry, or nearly so, the tube could be removed without in any way interfering with the healing of the wound or the ultimate result of the operation.

Dr K. M. Douglas asked Dr Croom how he dealt with the superficial wound. In many cases one saw some time spent on the arrest of the bleeding from the vessels of the abdominal wall. Having seen on many occasions Dr Martin of Berlin perform laparotomies without applying any ligatures to these vessels, he would ask Dr Croom to acquaint them with his practice in that respect.

The President remarked that a claim had been put forward in the earlier part of Dr Croom's paper which it was interesting to find passing nowadays unchallenged in the Medico-Chirurgical Society. It was with reference to the class of medical men who had most right to perform such operations. It had been asserted at some of their meetings that the obstetricians ought to leave them to men possessing a special surgical genius for such work; but Dr Croom's claim for the right of the obstetrician to perform them had not even been criticised.

 $Mr \ A. \ G. \ Miller$ said that he had listened to Dr Croom's paper with great pleasure, and considered it a most valuable contribution to the literature of the subject. The class of cases in which he had to perform laparotomy was different from that in which Dr Croom operated. The ordinary surgeon had worse cases to deal with than the ovariotomist. They were mostly cases of intestinal obstruction, in which the patient was more or less collapsed, and otherwise in an unfavourable condition. He had noted with interest two points specially in Dr Croom's paper. First, a statement that peritonitis was no contraindication to opening the abdomen. Secondly, that cases of tubercular and purulent peritonitis were peculiarly suitable for operation, and did well. He would like to ask Dr Croom if he had any experience of septic cases, such as appendicitis with perforation, and what his opinion would be in regard to the comparative risk of opening the peritoneum in such cases ?

Dr Croom desired to thank the Society for the kind and courteous manner in which they had received his paper. He was specially interested in the remarks of Mr Caird; and in respect of the point of eventration, he wished to say that he had tried the method suggested by Mr Caird of altering the position of the pelvis; but his experience had been unfortunate, for he had found that the patient herself was nearly suffocated. This might have been an accident : nevertheless, he had never tried Trendelenburg's plan again. He desired to thank Dr Brewis for the valuable criticisms he had offered. He quite agreed with Dr Brewis that it was a very little matter how the pedicle was treated, so long as it was treated tightly enough. Dr Brewis had already established his reputation in operative gynæcology, and he was interested to hear his opinions on antiseptics, which practically coincided with He begged to acknowledge his indebtedness to Dr his own. Brewis for pointing out to him his omission about the bluntpointed needle, which, of course, he recognised as being of first importance. Mr Miller's remarks seemed to him most pertinent. He quite acknowledged that there was a very distinct difference between the laparotomy which usually fell to the lot of the surgeon and that which fell to the gynæcologist. In the one case the surgeon operated at the request of the physician only after all medical means had failed, and as a dernier ressort, whereas the gynæcologist operated purely on his own responsibility, and with entire charge of the case from the commencement. He was quite sure that this was the entire difference between the pure surgeon and the gynæcologist. He was very greatly indebted to Mr Miller for the kindly manner in which he had spoken of his paper. In reply to Dr Douglas, he begged to say that any hæmorrhage from the incision was immediately stopped by a few minutes' pressure by Pæan's forceps. He had never any trouble from this source. With regard to sewing up the wound, he preferred the simple interrupted suture.

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Meeting IV.—January 15, 1890.

Professor A. R. SIMPSON, President, in the Chair.

I. EXHIBITION OF SPECIMENS.

1. Dr William Russell exhibited—(1.) Two specimens of CAR-CINOMA OF THE STOMACH—one from a man æt. 71, the other from a woman æt. 80—in neither of whom had there been any symptoms referable to the stomach. In the first case the patient died suddenly, and the stomach was found distended with recent bloodclot. In the first the carcinoma was in the lesser curvature, in the second it surrounded the pylorus, and in both cases there was ulceration. (2.) A specimen of NECROTIC PNEUMONIA, from one of two similar cases which he had examined in the Royal Infirmary the preceding day, and which he suggested were related to the special type of poison which was prevalent at the present time.

2. Dr Alexander Bruce exhibited a drawing of an ANEURISM of the lower part of the THORACIC AORTA, with FALSE ANEURISM OF LUNG.

II. ORIGINAL COMMUNICATIONS.

1. Dr Scott Lang read a paper on the LATERAL CURVATURE OF THE SPINE, ITS PATHOLOGY AND TREATMENT.

The President thought Dr Scott Lang had no need to apologise for bringing before the Society his ideas in regard to a condition that often caused considerable trouble to practitioners. He (Professor Simpson) believed that Dr Lang was correct in attributing the deformity to muscular action; and many years ago he had seen good results from exercising with machines which called into fuller play the muscles of the left side attached to the concavity of the dorsal scoliosis. In treatment it was important to keep in view also the constitutional condition, as many of the affected individuals belonged to families with a strumous diathesis.

Dr Hughes disagreed with the theory that the serratus magnus could have much action in producing lateral curvature due to its action on the ribs, as it could only act on the ribs when the shoulder was fixed; and as the muscles were better developed in the male, it would tend to the greater frequency of lateral curvature in the male than in the female, which was not the case. Dr Scott Lang had stated that he could not recommend Mr Barwell's bandages as an efficient means of treatment. In answer to this, Dr Hughes thought it was unfair from a single trial to disapprove of what had proved of great service in a large number of cases in Mr Barwell's hands.

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Dr Black wished to ask if the lateral curvatures of spinal deformity had any effect in modifying the natural antero-posterior curves, as if not, the spinal column would have a spiral form.

Dr Troup remarked that he happened to know a family of young ladies who never had been allowed to wear stays. One of them had developed this right lateral deviation of the spine, so that it could not be the wearing of these appliances which helped to cause the deformity by restraining abdominal breathing.

Mr F. M. Caird expressed the pleasure with which he had listened to Dr Scott Lang's paper, but he doubted if the extremely ingenious theory which gave such a prominent place to the action of the serratus magnus as a factor in causing scoliosis was an adequate explanation. One might expect in that case to meet with scoliosis when there was paralysis of the serratus. He agreed with Dr Scott Lang that the tips of the spinous processes did often curve towards the bodies of the vertebræ. Surgeons were tolerably well agreed that a loss of muscular tone started scoliosis, and hence the general treatment was one in which attention was mainly directed to strengthening the muscles and nerves. For this purpose appropriate calisthenic exercises did what was necessary, while jackets and spinal apparatus would most likely do harm, unless they were suitably used as adjuncts to give supports after exercise. They could not take the place of such exercises. It was always necessary to increase the capacity of the chest and promote the general health, hence one could not advocate any fixation of the arms.

Dr Scott Lang, replying, thanked the gentlemen who had given him the benefit of their views. He admitted the correctness of the President's remark. In reply to Dr Hughes, he pointed out that the serratus magnus could not act unless the scapula was held The serratus magnus acted in conjunction with the trapezius fixed. and the rhomboids. He wished to know Dr Hughes' authority for the statement that the shoulders were more fixed in man than in The theory, however, was not dependent on any vague woman. statement of this kind, but upon the fact that the breathing was more thoracic in woman than in man. Dr Hughes altogether avoided the question of the production and the raison d'être of the so-called natural curves of the spine. If Dr Hughes wished to argue in favour of spinal supports as curative agents, he ought to have due regard to the pathological anatomy as it had been demonstrated. Dr Hughes, however, avoided such facts. Replying to Dr Black, the antero-posterior curves were doubtless somewhat modified, but these curves naturally varied considerably in healthy individuals. Mr Caird had not ventured to suggest any other theory as to why the complaint occurred almost exclusively in women. The spinous processes are not turned towards the convexity in the whole extent of the curve, but only at the most extreme part. He was very thankful to Mr Caird for his valuable suggestions regarding rest to muscles, also as to whether it was justifiable to restrain the

action of muscles apparently too strong. The latter plan of treatment should, of course, only be used in the most cautious manner. Regarding cases of paralysis of the serratus magnus, it would be very interesting to follow out such cases ; and he remembered one which Mr Caird had shown to the Society some months ago. There was no getting away from the fact that the bones were formed in accordance with the muscles acting upon them; consequently, if the skeleton of the thorax showed no atrophy of ribs on one side, we would be justified in disbelieving that paralysis of the serratus magnus had existed. Replying to Dr Troup, he suggested that the ladies in question, although not wearing stays, perhaps wore some band or other apparatus having a similar effect. Ladies must wear a waistband to support their dresses, petticoats, etc.; but the theory was not upset by the cases alluded to. The question was not whether Miss So-and-so wore stays or waistbands, but Was the breathing more thoracie in woman than in man? Dr Troup would not venture to deny this physiological fact, upon which the theory In view of all the facts, it therefore seemed probable that rests. the ladies alluded to by Dr Troup would be worse than they were if they laced tightly, or did anything to make the thoracic character of their breathing more pronounced. On the whole question, he did not see that there was a link in the chain awanting. The foundation of it existed in the corelation of structurethat every part of our bodies was developed and moulded in accordance with the forces acting upon it, the functions required of it, and the structures in relation to it. Leaving aside for the moment the force of heredity, they had thus in the environment an explanation of everything in anatomy or pathological anatomy, from such a question as why the lion was tawny down to the question of why the skin was thick on the soles of our feet. It was all a question of development. The spine had its "natural" curves simply because it could perform its functions best with those curves. They were developed after birth in relation to the forces acting upon the spine. To this same principle he looked for the explanation of the pathological changes visible in the specimen of lateral curvature shown to-night.

2. NOTES OF A CASE OF CARCINOMA OF SUPRA-RENAL CAPSULES AND LUNGS; KIDNEYS FREELY MOVABLE.

By JAMES RITCHIE, M.B., M.R.C.S. Eng., F.R.C.P. Ed.

Pathological Report by ALEXANDER BRUCE, M.D., F.R.C.P. Ed., Pathologist to the Royal Infirmary, etc., etc.

MISS K. M., æt. 73, prior to her more severe symptoms, had been gradually losing flesh and strength for about a year. She had, however, been able to perform her household duties, which were not heavy, except that she had been somewhat severely taxed in nursing an aged invalid relative. In addition to loss of flesh and strength she complained that her breathing was shorter than it used to be, especially after exertion. On March 20, 1889, she complained of sickness, occasional diarrhœa, complete absence of taste, dryness of mouth, discomfort in the epigastrium, and severe pain across the sacrum and down both outside and inside of left thigh.

On examination her temperature was normal; she was much thinner than when she was examined a year previously; the tongue was dry, rather furred, especially on the left half. This continued throughout the illness, and for it no local cause could be discovered. Pressure on epigastrium revealed tenderness, and produced catching of the breath and a short dry cough. There was no enlargement of liver. The urine was scanty, high coloured, acid, depositing pink urates. Respirations, 25, easily excited; frequent dry cough; no dulness on percussion; on auscultation a few sibilant râles. The treatment consisted in rest, simple diet, turpentine stupes to painful parts, sedatives to stomach, and alkalies.

A few days later, without known exposure, there was a sudden rise of temperature to 101°, with all the signs of acute bronchial catarrh. Under ordinary treatment this quickly subsided, and the temperature became normal. During the succeeding four weeks, and, indeed, throughout the illness, there was great variability of symptoms, referable to the digestive system; at intervals of about a week there occurred sudden change from a condition of comparative comfort to sickness and diarrhœa, or diarrhœa alone—these attacks being generally accompanied by pains in one or both thighs. Upon one occasion, having been called in consequence of an exacerbation, when the abdomen was being examined there was felt in the left iliac fossa a firm mass, tender on pressure. The patient was at the time lying partially on the right side; when she moved on to the back to permit of further examination the tumour disappeared. Closer investigation showed that we had to do with movable kidney, which could be readily slipped downwards and fowards when the patient lay on the side, and which resumed the normal position when the dorsal decubitus was taken. It was further observed that the right kidney was nearly as mobile. The patient had never prior to her illness suffered discomfort on assuming the erect posture; but by-and-by, when she was allowed to sit up and to get out of bed, she experienced pain and a sensation of sinking, unless she wore a flannel bandage with pads to keep the kidneys in situ.

Towards the end of April there was an improvement in symptoms relating to the digestive organs, with return of taste. Miss M. was therefore allowed to go to the couch; but without any known exposure the temperature again rose to 100°, or a little above it; the cough became more troublesome; sputum scanty,
white, gelatinous, never bloody. Examination of the chest revealed feeble expansion at both apices, dulness on percussion, prolonged expiration, harsh breathing, and increased vocal resonance. Examination of the rest of the chest showed nothing marked beyond a somewhat feeble expansion. No bacilli were found in the sputum.

During the next few weeks the temperature was frequently a little above normal in the afternoons. After consultation on May 22, it was agreed that there was some inflammatory process of a low type going on at the apices; the patient was recommended to go to the country, where a little open-air exercise could be had without fatigue. The medication had been Begbie's mixture.

A few days after going from home, viz., in the beginning of June, there was a recurrence of gastro-intestinal disturbance, which kept her confined for a week. She was next examined on June 22, at which time the condition of the apices was unchanged : nothing special was noted in the condition of the rest of the chest. She again went to the country, and on her return she was placed under the care of Dr Playfair in consequence of Dr Ritchie's absence from town. When she was next examined it was found that she had deteriorated very considerably. Epigastric tenderness was marked, and there was found on palpation a nodular swelling indistinctly felt in the epigastrium. The liver was not enlarged. Examination of the chest revealed feeble expansion all over, with impaired percussion note, the respiratory murmur feeble and harsh; respiration very rapid and shallow, amounting to dyspncea, and causing a considerable amount of suffering; cough short, dry; expectoration scanty, with the same characters as formerly. The temperature was always now above normal, varying from 99° to a little above 100°. The pulse rapid and feeble. The patient gradually sank, and died of asthenia on August 20.

When Dr Ritchie asked his friend Dr Bruce to make a postmortem examination, he said that he had to acknowledge an uncertainty as to the probable conditions which would be found. Carcinoma of the stomach was expected—not of the pylorus, but of the body of the organ. At the same time there were difficulties in the way of this diagnosis. The gastric troubles had been frequent and various, but they had not presented the degree of severity which is common in carcinoma. There was no pain after food; there never had been vomiting of blood; and examination of the stools by means of the guaiacum test had not shown blood.

As to the condition of the lungs, although the dulness had first appeared at both apices, the absence of high temperature and the character of the sputa were against the diagnosis of acute tuberculosis. The cachexia, the extensive dulness, the greatly impaired lung function, and the probable existence of cancer in the stomach, rendered the diagnosis of secondary cancer more probable. It is to be noted that there never was any blood in the sputa.

70 A CASE OF CARCINOMA OF SUPRA-RENAL CAPSULES AND LUNGS,

The movable condition of the kidney was one of great interest in consequence not only of its comparative rarity, but also of the very considerable amount of displacement which was possible, the facility with which the change could be made, and the precise position of the organ determined in consequence of the thinness of abdominal parietes, also the development of the condition after the patient had lost the natural fat. Of 91 cases collected by Ebstein, in 12 only were both kidneys movable.

In view of the condition of the supra-renal capsules which was revealed at the post-mortem examination, it is worthy of note that there was no pigmentation of the skin nor of mucous membrane; that the loss of strength was in proportion to the loss of flesh which preceded it; that there was no marked anæmia; the heart's action and the pulse were good until near the fatal termination; there was no palpitation, no faintness nor giddiness, no dimness of vision beyond that which had been present for years. Hiccough was, however, occasional. The pulse-rate up to near the close of the case was usually about 90. The symptoms were thus not at all characteristic of Addison's disease. Dr Wilks has pointed out that in cancer of the supra-renal bodies these symptoms are not present.

Pathological Report.

At the post-mortem examination, which was held on the day after death, the body was found to be extremely emaciated. Both kidneys could be distinctly felt through the anterior abdominal wall when pressure was made from behind, and their outline could be distinctly made out. On opening the abdomen the mobility of the kidneys was ascertained to be due to the laxity of the peritoneum which covered them. This condition had been brought about by the complete absorption of the perinephric fat.

The stomach was slightly atrophied. There was no evidence of tumour in its wall or in any part of the intestinal tract. Behind the stomach, between it and the pancreas, was a chain of glands, five or six in number, rather larger than hazel nuts, very hard in consistence, and adhering by their capsules. The supra-renal bodies were enlarged on both sides to the size of walnuts : they were not adherent to the kidneys. In both cases the swelling was somewhat nodular. On section they were seen to be infiltrated with grayish-white new growth of very hard consistence. It was observed that in both cases the cortex was apparently uninvolved. It presented the appearance of a narrow, orange-brown line at the periphery of the gland. On the detection of the supra-renal lesion the skin and mucous membranes were carefully examined for evidence of abnormal pigmentation, but none was found. The other abdominal viscera were absolutely free from new growth.

On removing the thoracic viscera the heart was found to be of small size, but otherwise normal. Both lungs, however, were much

involved. In the left lung, the lymphatic system, of the lower lobe more especially, showed an exquisite network of gravish-white moniliform lines. On the inner surface of the posterior half of the lower lobe, near the root, numerous flat grayish-white nodules, varying in size from the head of a pin to the diameter of a hemp seed, shone through the pleura. The larger nodules were evidently formed by confluence of the smaller. In the upper lobe the lymphatic injection was marked to a much less extent, but the anterior part of it was evidently partially consolidated, and somewhat larger grayish-white nodules projected through the pleura. On section this part of the lung exhibited a close aggregation of gravish-white nodules somewhat resembling those of catarrhal pneumonia. They were granular on the surface. The lymphatics of the interlobular septa and round some of the smaller bronchi, especially of the lower lobe, were injected with the gravish-white masses noted on the pleural surface. On section of the lower lobe, gravishwhite nodules similar to those already described were seen much more sparsely scattered through the lung substance. In this lobe the general injection of the deep lymphatics of the inter-lobular septa was also well marked, as was also that of the peri-bronchial and peri-vascular lymphatics. The glands at the root were somewhat enlarged, and their periphery infiltrated with gravish-white substance. The right lung was much more involved than its fellow. The lymphatic injection was extremely marked in the lower lobe and on the inner surface below the root. Nodules about the size of peas projected through the pleura. On section the upper lobe showed scattered white nodes much as in the lower lobe of the opposite lung. In the anterior part of the lobe the infiltration was so great as almost to produce the appearance of gray hepatization. thin milky juice could be scraped from the surface. On section of this part of the lung the inter-lobular septa were injected as already described. In the middle lobe was a similar condition resembling gray hepatization. On a close examination, however, this appearance was found to be due to coalescence of small nodules. The lower lobe in its upper third presented a somewhat similar appearance. In the rest of its extent the nodules were more scattered. The lymphatics surrounding the larger and middle-sized bronchi were infiltrated and somewhat thickened.

The microscopic examination of the supra-renal bodies showed a great development of large epithelial cells arranged somewhat irregularly in the meshes of a dense fibrous stroma. The cortex was apparently almost normal. The lymphatic system of the lung was injected with large cells like those of cubical epithelium. Here and there there was a tendency to the assumption of a tubular arrangement. In the white nodules above described the large cells had grown into and completely filled the alveoli of many of the lobules. Examination of parts of the bronchi where the peri-bronchial lymphatics were much involved, showed that in many parts there had been an epithelial ingrowth from these lymphatics to the lymphatic system of the mucous membrane of the bronchi. In no part of the bronchi examined could any evidence be found that the neoplasm had commenced in the mucous membrane.

The history of the case as well as the pathological appearances seem to point to the supra-renals as the primary focus. The involvement of both supra-renal bodies by a primary carcinoma has been frequently observed previously. When carcinoma invades the lung primarily it almost invariably commences in one of the larger bronchi, and diffuses thence throughout the lymphatic system of the lung, causing great fibroid thickening of the pleura and inter-lobular septa. In this case the evidence seemed to point to the invasion being in the contrary direction towards the bronchi and air vesicles rather than from either of them outwards. The absence of the pigmentation of the skin was also interesting as corroborating the view that Addison's disease is related only to caseous degeneration of the supra-renal bodies. It is worthy of note that the cortical portion of these glands had escaped almost entirely from involvement.

Dr Black concurred with the author in the explanation of the double character of the carcinomatous deposits, that the postmortem appearances as seen were of secondary nature, and that the interest of the case was enhanced by the non-discovery of a probably single origin of the disease in other parts of the digestive system unexamined.

Dr Wm. Russell was inclined to regard the case as one of primary carcinoma of the supra-renal capsules, the lung implication being secondary. He had found carcinoma of the capsules more common than was generally recognised, and the mode in which the process in the lung had extended from the root tended to indicate that the disease there was secondary, and probably the result of lymphatic infection. As to the absence of discoloration of the skin, the view that its absence was due to the incomplete destruction of the glands was disproved by the fact that in recorded cases where they were completely destroyed by malignant growth there was no discoloration. The presence of obstinate vomiting in this case was of interest, as it was often a prominent symptom in Addison's disease, and the question did present itself, whether the condition of the adrenals had anything to do with the symptom in this case. In his own experience it had not been a symptom of malignant disease of these glands.

Dr Bruce replied.

Meeting V.-February 5, 1890.

Professor A. R. SIMPSON, President, in the Chair.

I. EXHIBITION OF PATIENTS.

1. Prof. Grainger Stewart showed a case of PARAMYOCLONUS MULTIPLEX, and pointed out the main features of the disease. The patient was a girl æt. 13, who had suffered from the disease for about twenty months. Her family history, habits, and previous health were good. The illness began with occasional headaches and gradually increasing pallor. Three months later the characteristic jerkings began. They were first noticed in the neck and head and then extended to the arms and shoulders. On admission to the Infirmary patient was very anæmic, and functional cardiac bruits were audible over the base. The urine was phosphatic. The nervous system was normal, except as regards the motor functions. Voluntary motion was unaffected. At quite irregular intervals there were short, rapid jerks of the head backwards, each being caused by a single muscular contraction. Sometimes two or three jerks followed in rapid succession. There were similar occasional jerks of the flexor muscles of the wrist and forearm and of the muscles about the shoulder. The movements were bilateral, and were apparently unaffected by attention or effort, while the lower limbs and hands were quite free. Prof. Stewart stated that the disease had been first described by Prof. Friedreich of Heidelberg about 8 years ago, and that only a few cases had as yet been recorded. From these it seemed probable that a considerable variety existed, and that, as certain French writers were seeking to show, it might be proper to recognise four types, viz.,—a clonic, a tonic, a tetanic, and a fibrillary form. The present patient belonged to the clonic type. With regard to treatment, some improvement had taken place under iron tonics. Arsenic had proved of little service. Electricity had been applied as recommended by Gowers-voltaic electricity from the spine to the affected muscles-but still, as the members of the Society had seen, the condition persisted.

2. Mr Charles W. Cathcart showed a case of TRAUMATIC CYST OF PANCREAS; RUPTURE AFTER HYPODERMIC PUNCTURE; LAPAROTOMY; RECOVERY. The case was reported by R. W. Chew, M.B.

P. R., æt. 13 years, admitted 4th May 1889 to Ward XVI., Royal Infirmary, Edinburgh, suffering from contusion of abdomen.

History of Injury.—On 4th May, between 4 and 5 P.M., while patient was playing on a moving lorry carrying several ewt. of coal, the carter struck at him with his whip, and he jumped off,

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but fell, and the hind wheel of the lorry (which was moving rapidly at the time) passed over the upper part of his abdomen.

On admission he seemed somewhat stupified, but showed no other symptoms of collapse or shock.

May 5th.—Great pain over upper part of abdomen (superficially); breathing thoracic; difficulty in micturition; on left side of abdomen, just above iliac crest, slight ecchymosis; slight crepitation on right side of thorax about level of tenth rib. Temperature, 97°.6 to 99°.4; pulse, 130; respiration, 20.

May $6t\bar{h}$.—Abdomen slightly swollen; pain, especially on moving, relieved by the application of a flannel binder; micturition normal. "There is no contraction of the abdominal muscles, except over an area about 3 inches square in left lumbar region." Pulse rapid, 140; pleuritic crepitation over sixth and seventh left ribs; short cough.

May 7th.—Pain still present over left side of abdomen, chest, and neck; crepitation still; temperature, 99°·1.

May 8th.-Bowels moved per se for the first time.

May 9th.—Some pain still continues; rest normal.

May 18th.—Discharged cured. No swelling nor other abnormality noted.

Re-admitted 20th July 1889 complaining of swelling of, and pains about abdomen of a spasmodic character, coming on during fasting, and relieved by food. This is said to have existed for about three weeks. On admission, very pale, with flushed cheeks; left side of abdomen swollen, the swelling occupying left hypochondriac region, and extending from it into the left lumbar and umbilical regions; lowest portion an inch below and to right of umbilicus; size and position of tumour unaltered by changing position of patient. On palpation, margin of swelling well defined; tumour feels firm and resisting; no pain on pressure. On percussion, dulness extends up into left hypochondriac region, and is apparently continuous with splenic dulness; stomach sounds masked, *i.e.*, that viscus is displaced. Measurement round body, over most prominent point of tumour $(2\frac{1}{2}$ inches above umbilicus), taken during deep expiration, was 261 inches. Temperature normal. In view of a possible splenic enlargement, blood was examined, and showed a diminution of red corpuscles, with an apparent increase of white ones, and numerous microcytes. Heart sounds normal. Urine normal, both as regards quantity and reactions. Appetite apparently unaffected.

July 22-30.—Patient kept in bed, and on a milk diet. Girth varied from $26\frac{1}{2}$ to $26\frac{7}{8}$ inches. Pain during fasting much diminished. The tumour apparently not affecting general health any further. Diagnosed by several as a splenic tumour.

July 31.—About 1 P.M., Mr Cathcart, having recognised fluctuation, plunged a hypodermic needle into the tumour at its most prominent point (see Diagram) about 2 inches above and to the left of the umbilicus, and drew off about half a drachm of a transparent reddish fluid. This on examination was found to contain a



Diagram illustrating the position of the Pancreatic Cyst; X seat of puncture

few red corpuscles. Almost immediately after the needle was withdrawn the patient screamed and writhed with pain. This at first was localized at the point of puncture, but soon spread all over abdomen. In about half an hour there was flattening where tumour had existed, with slight bulging at flanks. On percussion, stomachnote now clear, whilst there was dulness on sides. The temperature rapidly fell from normal to 97°.2 or 97°. In about an hour vomiting of greenish matter came on, and a state of great collapse supervened. After consultation with Dr John Duncan, Mr Cathcart decided to open the abdomen at once, but it was not until 6 P.M., and after great difficulty, that consent of parents was obtained. Abdominal cavity was then opened into by an incision in linea alba, extending from a point 21 inches below ensiform cartilage to a little below umbilicus, round margin of which it curved. About 40 oz. of dark-coloured (sanguineous) fluid escaped. Kidneys and spleen were found normal, and no peritoneal adhesions could be made out. By working between transverse colon and stomach, the lesser sac of peritoneum was entered, and a cyst discovered lying partially collapsed behind the stomach. This cyst was freely opened, when more clear brown fluid escaped. As the collapsed cyst could not be easily drawn into the abdominal wound, and as the original aperture in the cyst was not to be found, Mr Cathcart decided to drain it from behind the peritoneum. With this object, he explored the cyst's cavity with his finger, and found that below and behind the point of the twelfth rib of the left side the finger inside the cyst could be pressed directly out against the skin. At this point, therefore, a counter opening was made and a large drainage-tube was passed into the cyst from behind. The cyst and the general peritoneal cavity were then douched with warm boracic acid solution. After this the abdominal wound was closed with deep and superficial sutures, and corrosive wool dressing and a binder applied. At 8 P.M., temperature 100°.2; pulse, 154. The fluid removed soon clotted. The liquid part was of a deep port-wine colour. It had a saline taste and a faintly alkaline reaction. It contained no urea, but had a large quantity of albumen, chlorides, and blood. The solid part had all the constituents of blood-clot.

July 31.—Patient kept under influence of morphia; careful stimulation; urine drawn off. Temperature, 99° .8 to 100° ; pulse, 100 to 140.

August 1.—Slight vomiting in morning; sips of warm water allowed; "Brand's essence" in small quantities by the mouth, and nutrient enemata; dressed in evening, when there was only a slight discharge from wound; stimulation continued.

August 2.—Nausea present; temperature, $99^{\circ}\cdot4$ to $98^{\circ}\cdot4$; pulse, 100 to 120; dressings soaked with a serous and alkaline discharge; passing water without the catheter; wound on each side dressed again at night.

August 3.—Bowels moved slightly; discharge from wound more pronouncedly alkaline, as shown on the boracic lint.

August 4.—Both wounds dressed; a little arrowroot allowed.

August 5.—Tube shortened; complaining of pain at both wounds for a time (caused by the irritation of some faulty biniodide of mercury lotion); considerable flatus passed by the mouth; arrowroot replaced by boiled bread and milk, as the former did not seem to agree with patient.

August 6.—Tube changed for a smaller-sized one; food per mouth increased, and a corresponding increase of discharge.

August 7.—Both sheet and shirt soaked with watery discharge; skin around wound not reddened; some of discharge squeezed out from dressings, and examined. Reaction faintly alkaline; contains large amount of serum, albumen, and chlorides; no sugar; does not affect egg albumen; converts starch into glucose.

August 14.—Tube shortened; discharge less; patient was removed to large ward yesterday.

August 18.—Discharge more profuse, patient having to be dressed twice daily; diet no longer restricted.

August 19.—Rise in temperature; headache, and indefinite pains about abdomen; castor oil administered; patient sick; vomit, bile stained; stools greenish, with fragments of undigested food. August 20.—Hardly any discharge; what there is is not nearly so alkaline as formerly. Liq. pancreaticus, 3ss. t. d. s.

August 22, 2 A.M.—Dressings soaked; redressed; a number of papules over and around crest of ilium, apparently caused by irritation of discharge; zinc ointment applied.

August 24.—Slight stain of blood in discharge, tube being shoved out; a shorter tube inserted; the eruption not nearly so troublesome.

August 29.-Very little discharge ; tube taken out.

September 9.—Wound in side nearly healed; patient allowed up for a while.

September 19.—No symptoms of any kind; sent to Convalescent Home.

REMARKS.—There are several points of considerable interest in this case, which I propose to discuss under the heads of Nature of the Cyst, Effects of the Hypodermic puncture, Mode of Draining the Cyst, and Pathology of the Condition.

Nature of the Cyst.-When I came on duty on 31st July, fluctuacion in the abdominal swelling was distinct. An ordinary blood cyst seemed excluded, for no manifest swelling had existed when the boy had left the Hospital fourteen days after the injury. I suspected either a chronic subperitoneal abscess or a traumatic hydro-nephrosis, such as is sometimes seen¹ after an injury to the loins. The idea of pancreatic cyst did not occur to me. Had I read the accounts of these cysts published by Senn and others as carefully before the operation as I have done since, and had I resorted to the method of inflating the colon and stomach, I ought at least to have strongly suspected the swelling to be pancreatic. The unexpected and disastrous effect, however, of the diagnostic puncture took me at a disadvantage, and made an immediate operation imperative. The clear, blood-stained character of the fluid drawn off by the hypodermic needle, and especially the irritating effect of the fluid upon the peritoneum when the cyst wall ruptured, made me think still more of hydro-nephrosis. This view was only dispelled when I had recognised by my fingers in the abdominal cavity that both kidneys, and, in fact, all the organs below the transverse meso-colon, were apparently healthy. The cyst was greatly collapsed, and I searched for it behind the stomach when I saw that it could be nowhere else.

I believe the cyst to have been pancreatic in its origin, for the following reasons :----

(1.) Pancreatic cysts in most respects similar to the present one have been described as following a severe injury to the hypogastric region, such as this boy received. Thus Senn's case followed a contusion by a fall on to the left side of the abdomen, a heavy keg

¹ "Die traumatischen Verletzungen der parenchymatözen Unterleibsorgane Edler," Arch. für Klin. Chir., Band xxxiv. p. 754. at the same time striking the patient's back. Kulenkampff's case¹ followed blows about the umbilicus, which were directed upwards; and Treiberg's case² was traced to injuries inflicted upon a young man by roughs.

(2.) Because the position of the cyst corresponded to that of the pancreas.

(3.) Because the reactions of the fluid, especially in its changing starch into glucose, as tested by Dr Chew, corresponded to those of previously described pancreatic cysts. In no case has any action on albumen by the fluid from these cysts been found, although looked for.³

(4.) Because the persistence of the watery discharge, its variability, and its observed temporary increase, with improvement of the patient's diet, accord with the view of a cyst communicating with the pancreas.

On the other hand, the maceration and irritation of the skin by the discharge usually observed in pancreatic cysts was practically absent in this case. Possibly, however, the dressing used may explain this peculiarity. Next the skin, and beneath the dry corrosive wool, I always laid a large piece of boracic lint wrung out of boracic or corrosive sublimate lotion. The red litmus colouring of the lint was always changed to blue at the next dressing, but some neutralization of the alkaline fluid must have occurred which may have so far protected the skin. From the "macerated" appearance of the skin in previously described cases, from the presence in the discharge of excess of alkali, and from the practical absence of trypsin, the irritating effect on the skin would seem to be due to alkalinity rather than to any supposed digestive power of the cyst secretion. This is all the more probable because a similar effect has often been observed near biliary and intestinal fistulæ, which also discharge an alkaline, but not a peptonizing fluid. To diminish this irritating effect in such cases acid dressings might be used, besides the protection of the skin by the application of ointments as above previously employed.

In many of the published cases of pancreatic cyst great epigastric pain was observed. In this case the pain was not very great, and was relieved by food.

Effects of the Hypodermic Puncture.—It is certain that the hypodermic puncture caused the cyst wall to rupture and to discharge its contents into the peritoneal cavity. It is also certain that acute peritonitis, thereby set up, would, in all probability shortly, have killed the patient had the operation not been done. We

¹ Berlin. Klin. Wochen., 12th February 1882.

² See abstract in Annals of Surgery, November 1888.

³ Senn (Amer. Journal of Med. Sciences, 1885), in his report of Gussenbauer's case (Arch. f. Klin. Chir., Band xxix.), says that the fluid "digested albumen" (p. 26); but, on consulting the original, I find that it did not,—" Amylum in Zucker verwandelt und demnach nichts Anderes als Pancreassecret war" (p. 360).

often hear of the risk of starting sepsis by a diagnostic puncture with a dirty needle, and of the danger of aspiration with a large one through the peritoneal cavity, but seldom of the risk of rupture of the cyst wall by a fine needle. In many of the recorded cases a hypodermic puncture was performed, and in only one did peritonitic symptoms appear.¹ These lasted for eight days. The majority of those who have written on pancreatic cysts distinctly recommend hypodermic puncture. Thus Senn writes,— "An exploratory puncture with a fine and perfectly aseptic needle of a hypodermic syringe will not only add material diagnostic information by revealing the character of the cyst contents, but the procedure will also settle the question as to the existence or absence of adhesion between the cyst walls and the parietal peritoneum."²

My case, however, proves clearly that the procedure involves a considerable risk where the cyst wall is thin. This it seems often to be in pancreatic cysts, and would be specially so where they are large, of recent growth, and traumatic in origin. In such cases, and possibly also in others, one would only be justified in puncturing through the peritoneal cavity if everything were ready for an immediate laparotomy should rupture take place.

In this connexion I may quote from Knowsley Thornton's *Lectures on the Surgery of the Kidneys,*—" The second warning I would emphasize is, never to tap a suspected renal tumour through the anterior abdominal parietes, *i.e.*, through the peritoneum. From this rash proceeding I have also seen immediately fatal results."³

The severe peritonitis produced by the escape of the pancreatic cyst contents into the peritoneal cavity proves what has only been suspected before⁴—that rupture of such cysts is a distinct source of danger. This seems to be the first case on record where such has occurred. In Senn's experiments⁵ pancreatic fluid escaping from internal fistulæ into the peritoneal cavity was so rapidly absorbed as to cause no trouble at all. But when a large quantity of fluid, even although far from being pure pancreatic juice, is suddenly thrown upon the peritoneum, the result is evidently very different, as might have been expected.

Mode of Draining the Cyst.—In all the recorded cases the cyst has been successfully drained by stitching its wall to the anterior abdominal wound. I feared to do that in this case, because I had to make a hole into the cyst in addition to that caused by the

⁴ Senn, op. cit., p. 44.

¹ Kocher's case (Correspondenz-Blatte für Schweitzer-Aerste, 1st May 1888), reported in the Annals of Surgery, November 1888.

² Op. cit., p. 40.

³ Illustrated Journal, 30th November 1889, p. 205.

⁵ American Journal of Medical Sciences, 1886, p. 151.

needle puncture, which I could not find, also because the cyst wall was greatly collapsed. The boy was very weak, and could not safely have been kept long on the table. Hence I was driven to finish the operation as rapidly as was consistent with safety. Had I trusted to anterior drainage the second hole in the cyst wall might have allowed the cyst contents to leak into the peritoneum. A posterior drain while the patient was on his back was, however, calculated to keep the cyst cavity always empty. The result was perfectly satisfactory, although neither of the two anterior cyst apertures were artificially closed.

In similar cases, in future, an attempt to reach the tumour by diagnostic puncture might be made from below the posterior half of the twelfth left rib, and, if successful, the surgeon might dissect carefully, and reach the cyst from the same starting-point. At least in the case of large cysts which push a way for themselves this should be quite easy. The gain in not opening the peritoneal cavity and in not cutting into the abdominal wall is sufficiently obvious.

As to the pathology of these traumatic pancreatic cysts, Senn, in his first paper, thought that the injury caused a rupture of the duct, and that when this was afterwards closed by cicatrization a distension cyst resulted. He has since experimentally shown that complete blockage of pancreatic ducts causes atrophy of the gland behind, and only a slight distension of the ducts. He now believes the etiological factor to be "an arrest of absorption of the pancreatic juice."¹

Some such process as the following might explain the condition. The injury causes a laceration of the gland. This is followed by extravasation of blood, and with this is mixed the pancreatic secretion from the torn ducts. Not only is a constantly increasing fluid thus added to the original hæmatoma, but the collection of fluid probably becomes irritating in character. It will thus tend to excite the formation of a capsule round it, and by chemical irritation and tension would gradually increase in size.

This would explain the occasional onset of these cysts shortly after the injury, *i.e.*, before cicatrization could have produced its effects (swelling *observed* two weeks after injury in Senn's own case). In cases, also, where they have been several weeks of appearing, it is easy to understand their possible presence from the first. Small cysts near the pancreas would not be detected, and if they were slow of growing it might be several weeks before they attracted attention.

This view of the causation of traumatic pancreatic cysts would equally apply to similar renal cysts. Hitherto such have been explained by a partial blockage of the urcter, against which it may be urged that frequent aspiration or drainage often leads to

¹ American Journal of Medical Sciences, 1886, p. 207.

their cure, which would be less likely to occur if the whole kidney were involved than only a damaged part of it.

The case I have narrated is the fourth that has been recorded as resulting from injury to the pancreas (v. Cases 3, 7, and 14 of Table appended).

Cysts developing after fits of indigestion, or without any apparent cause, are more numerous. Altogether I can find references to twelve such cases. I do not specially refer to them, however, because the above remarks are only intended to be a commentary to this particular case.

No.	Operating Subgeon.	CAUSE OR FIRST SYMPTOM.	TREATMENT.	RESULT.	REFERENCE.
1	Bozemann.	Occasional attacks	Cyst dissected out.	Cure.	Med. Record, Jan. 14, 1872
2	Rokitansky.	None known.	Attempted incision of cyst; injury to	Death from peri- tonitis on the	Wiener Med. Pr., Nov. 15, 1881.
3	Kulen-	Upward blows	intestines. Laparotomy and drainage of cyst.	tenth day. Cure.	Berlin. Klin. Wochen., Feb. 1882.
4	Gussenbauer.	Gastric derange-	Laparotomy and	Cure with fistula.	Arch. f. Klin. Chir.,
5	Dixon.	Gall-stones.	Punctured.	Death in 84 days from pressure on bile aud pan- creatic ducts.	Med. Record, March 1884.
6	Lücke.	Malignant disease.	Laparotomy-clos- ure of wound.	Death from peri- tonitis.	Virchow's Archiv, vol. xli.
7	Senn.	Bruise of left side of abdomen.	Laparotomy— drainage of cvst.	Cure.	Amer. Journal of Med. Science, July 1885.
8	Hahn.	Vomiting and	Laparotomy-	Cure.	Centralblatt für Chir., 1885 No. 2
9	Riedel.	Gradual onset of swelling.	Laparotomy- cyst tapped.	Death from peri- tonitis in 96 hours.	Archiv für Klin. Chir., vol. xxxii.
10	Bilroth.	Convalescence from typhoid.	Laparotomy-at- tempted excision of sac.	Death from peri- tonitis.	Zeitschrift für Heil- kunde, 1886.
11	Ahlfeld.	Gradual onset of swelling.	Laparotomy-at- tempted excision.	Septicæmia- deatb iu 7 days.	"Inaugural Disserta- tiou," Marburg, 1886.
12	Küster.	Heavy fail on back from a carriage; eight years after- wards, sudden ab- dominal pain; col- lapse, followed by swelling.	Laparotomy— packing with iodo- form gauze, drain- age.	Recovery.	Deut. Med. Wochen., 1887.
13	Kocher.	Sudden abdominal pains.	Laparotomy—in- ciaion and drain- age.	Recovery.	Correspond. Blatte für Schweitzer-Aerzte, May 1888.
14	Treiberg.	Injury after assault.	Laparotomy—in- cision, drainage.	Recovery.	"Karkov Inaug. Dis- sert.,"1888 (v.Annals of Surg., Nov. 1888.)
15	Wölfler.	Gastric irritation from awallowing a liniment.	Laparotomy- packing, drainage.	Recovery.	Zeitschrift für Heilk., vol. 1x., 1888.
16	Annandale.	Gradual onset of epigastric swell- ing.	Laparotomy—in- cision, drainage.	Recovery.	Brit. Med. Journal, vol. l., 1889.

CASES OF PANCREATIC CYST TREATED BY OPERATION.

3. Mr A. G. Miller showed a young man on whom he had performed TREPHINING OF FRONTAL SINUS. Patient first complained of pain at the right side of the root of the nose, eyebrow, and eyeball, and of a discharge from the right nostril, in September 1888 He thought it originated in a cold. Abscess of antrum was suspected, opened in December 1888, and drained through a tooth socket. Pain and discharge still continuing, the frontal sinus was opened November 26th, 1889, when a considerable quantity of fœtid pus was discovered. A curved lead tube was retained for about a month. Patient when shown was perfectly well.

4. Prof. Annandale showed a patient suffering from a CICATRICIAL STRICTURE AT THE LOWER PART OF THE (ESOPHAGUS, the result of accidentally swallowing strong ammonia, and demonstrated in connexion with his case the introduction of Dr Leyden's œsophageal retention tubes. Prof. Annandale stated that he had used these tubes in several cases of malignant stricture of the œsophagus with most beneficial effects as regards the swallowing power. Patients who had been unable to swallow fluids without great difficulty were able after the introduction of one of these tubes to swallow fluids and semi-solid substances with ease. The retention of these tubes for a week or ten days at a time caused no irritation. When removing the tube it was important to pass down the guide and handle to the tube, otherwise spasm was apt to interfere with its ready extraction.

II. EXHIBITION OF INSTRUMENT.

1. Dr Gulland said this MICROSCOPE LAMP was first described by Dr W. Kochs in the Archiv für Mikroskopische Anatomie for 1888, and was patented by himself and Max Wolz in Bonn, the maker of the lamp. It consists of a small paraffin lamp which can be raised and lowered on a metal stand, and round the glass chimney of which is a long cone of japanned tin, with its upper end so bent as to carry the heat of the lamp away from the observer. Round the flame the inner surface is nickel plated, in order to throw all the light on the aperture, into which is fitted a solid rod of very pure glass, so bent that the end furthest from the lamp is brought up under the stage of the microscope, and illuminates the microscopical object with a flood of perfectly cool light transmitted by total reflexion along the rod. The illumination is so intense as to render a condenser unnecessary even with very high powers, but this brilliancy can be lessened by lowering the lamp, or by using the diaphragm, while the yellowness of the light can be corrected by placing a small disc of pale blue glass on the end of the rod under the stage. The rod can, of course, be made to illuminate the object obliquely, or be inverted in the aperture to throw light down upon an opaque object, and, used in a somewhat similar way, it might be made very useful clinically to illuminate cavities into which it is difficult to throw light by a mirror.

III. EXHIBITION OF PATHOLOGICAL SPECIMENS.

Professor Grainger Stewart stated that the patient from whom the specimens had been removed had been under treatment in his wards from about Christmas. On admission the patient gave a history which pointed to the probability of abscess of the liver having penetrated the diaphragm and been discharged through the lung, and a large quantity of pus was being daily expectorated. The first burst of pus had been preceded for some time by cough and other tokens of irritation. The expectoration gradually diminished, and ultimately ceased, and the patient was dismissed much improved in general health. A few days later he returned, complaining of some weakness in the right hand and arm, also in the right leg, and from his general condition, taken along with the local symptoms, it was feared that pyzemia had been established, and secondary abscesses formed in the brain, one in a position fitted to produce the paralysis. The course of the temperature did not, however, confirm the suspicion of pyæmia, and, as the paralysis diminished and ultimately quite passed off, the head symptoms seemed to be less important. He was kept under observation ; continued extremely weak, and was taken with hæmatemesis, from which he died. At the autopsy it was found that the liver was closely adherent to the diaphragm, the diaphragm to the lung, and a line of cicatricial tissue passed from the old abscess cavity in the liver through the diaphragm and into the lung tissue for a considerable distance. But the first glance at the liver showed that it was syphilitic, containing both cicatrices and gummata, as well as showing waxy degeneration. Near the seat of the old abscess there was another about the size of a walnut, containing a material resembling in consistence cream cheese, and it appeared that this was the result of the transformation of a gummatous mass. From the appearance of the cicatrix of the old abscess, it seemed probable that it also had originated in the same way. The brain showed two changes of importance, viz., an abscess of about the size of a filbert about the supra-marginal convolution, and a slight basal meningitis, probably of syphilitic origin. No symptom of dimness of vision was discovered, nor was there any paralysis of cranial nerves. The patient had stoutly denied the existence of syphilis during life, but was known to have been a very intemperate man.

IV. ORIGINAL COMMUNICATIONS.

1. FAT HERNIÆ IN THE INGUINAL REGION.

By KENNETH M. DOUGLAS, M.D., F.R.C.S. Edin.

THE chief significance of fat herniæ depends, I think, on the part they play in the production of herniæ of abdominal contents, whether bowel, omentum, or other organs. As I understand it, their mode of action in this respect lies in the influence exerted by them on the local resistance of the abdominal wall. On this point I would therefore offer one or two observations before speaking of the state of hernia adiposa particularly. Before doing so, however, I must express my indebtedness to Professor Braune of Leipzig for the material he placed at my disposal in his anatomical rooms, and for his valued advice and assistance.

One may readily allow that the stronger the so-called "thickened fascia transversalis" of the groin (which I would rather look upon and describe as tendon of the transversalis muscle), the less is any disposition to rupture present, but it must likewise be noted that if that structure be of *unequal* resisting power in different parts, such disposition (*i.e.*, to rupture) is increased.

Now, in practically all preparations which I have examined I have found two bands of tendon denser and stronger than the rest. One of these lies along the edge of the rectus, and is joined to it; the other forms the internal pillar of the deep abdominal ring.

In certain specimens exhibiting herniæ, in which the protrusion did not appear to be of very old standing, these bands or ligaments were specially well marked. I think one may justly suppose that the tendency to rupture is increased when the inequality of resisting power is great between them and the rest of the tendon. Thus, in the case of oblique inguinal hernia, one may hold that if the internal pillar of the deep ring be specially strong, the outer limit of the opening will, with more readiness, be separated from it when increased intra-abdominal pressure bears upon it, and so the deep ring will be opened up.

Some such view is indeed necessary to explain how a hernia can be produced in this situation by an equable intra-abdominal pressure, which one would rather expect to close the valvular opening of the canal. It being borne in mind that, according to my idea, the internal pillar of the deep ring belongs to the transversalis tendon, one must note that it will become tense and resistent when drawn upon in the contraction of that muscle. This will slightly separate the two sides of the deep ring, and the peritoneum will form an incline ready for the descent of a hernia.

Such a state of matters is most completely brought about when the body is flexed on the thighs, and one knows how often an oblique hernia descends while a patient is stooping and straining, as in lifting a weight. When he resumes the erect posture, the structures forming the deep ring press upon the rupture, and he is made conscious of its presence. The fact that taxis for the reduction of hernia is most effectual when the thigh is flexed confirms the belief that in this same posture the deep ring is open.

These suggestions do not, of course, diminish in the least the importance of the structures of the superficial ring in relation to the permission of hernial protrusions, and their constriction or strangulation. With respect to direct inguinal herniæ, I would suggest that their production would be favoured if the two bands I alluded to were greatly stronger than the intervening tendon—and this is often the case. I must apologise for dwelling on these matters, but the consideration of them is of moment, if, as I have suggested, a fat hernia may be a cause of any inequality in the resisting power of the wall.

It has been recognised that a sac of peritoneum may be drawn out from the cavity of the abdomen, and not extruded from it, and to this process we may now turn our attention. While engaged in the dissection of the groin, I had opportunities of examining several preparations in which there had developed the state of fat hernia. This condition has been observed by many anatomists and surgeons, and its general features are doubtless familiar to all. The process begins in a localized increase of sub-peritoneal fat, usually observed in relation to the abdominal openings of the inguinal and crural canals, seeing that at these parts a depression naturally exists, into which the fat may develop. It occurs elsewhere in the abdomen not unfrequently, but I shall only consider it as one meets with it in the inguinal region.

The interest of the process as occurring in relation to the deep abdominal ring is very great. The walls of the inguinal canal lie in close apposition, a relation which the intra-abdominal pressure tends to maintain. If, however, a mass of fat is formed in the sub-peritoneal tissue of the external inguinal fossa, as it increases it will insinuate itself in front of the defined inner pillar of the deep abdominal ring, and separate it from the anterior wall of the inguinal canal. The process thus begun goes on until the canal is wholly occupied by the fatty protrusion, which ultimately projects at the superficial ring.

I have observed the fat in the tissue of the cord, and also, in other instances, quite separate therefrom, and lying above it. As the protrusion of fat increases in size and weight, it renders the canal still more patent, and by its weight, and also by adhesions formed with the superficial tissues, the peritoneum is drawn down after it. There may first be observed a mere puckering of the membrane at the point where the fat is attached, which deepens until a distinct digital depression forms; this increases in size and depth, passes into and through the canal, and forms a sac ready for the reception of bowel or other contents.

The method by which this result is brought about is probably twofold. In the first place, the peritoneum being displaced by stretching of the loose sub-peritoneal tissue, passes into the inguinal canal by sliding on the subjacent layers, if one may so express it, but subsequently in all probability the tissue itself of the membrane is stretched.

In relation to the femoral canal, fatty herniæ may even more commonly be noticed if the dissection of the groin be carefully carried out. The fat mass lies in the crural canal, and may form a tumour in the groin of varying size. It often becomes adherent to the superficial fatty layer, with which it may be removed in dissection, and so escape notice. Here also the peritoneal sac is drawn down the canal, and may be followed by a hernia of the bowel on any rapid movement or increase, from any cause, of the abdominal pressure.

In one interesting dissection, the same mode of origin of a rupture was observed in Hesselbach's triangle. The condition was in the earliest stage, the peritoneum not even being puckered. On stripping it off there was found *attached to it* a small mass of fat lying just external to that tendinous band already noted as adjoining the rectus tendon. When the fat was removed, one found that it had projected into a deep fossa, which easily admitted the point of a finger, and passed inwards and downwards, ending at the superficial abdominal ring.

This condition would lead one to surmise that the development of a direct inguinal hernia may, in some cases, progress as follows :--(1.) The formation of a hollow in the wall, the transversalis tendon in its weaker part yielding under the pressure of a mass of fat. The inequality of local resisting power is thus increased. (2.) The filling of this fossa by a peritoneal pouch. (3.) The entrance of intestine or other contents into the sac thus formed. The same cadaver also exhibited a fatty hernia in the right crural canal, and "lipomata" of the linea alba. The facts of such a case as this afford some explanation of the clinical experience of many observers, and among these Richter, Scarpa, Sir Astley Cooper, and Cloquet, that individuals who become rapidly emaciated are prone to the occurrence of hernia. It is obvious that on the absorption of the fat in a fossa such as I have just described, the hollow remaining is a natural place for the peritoneum to enter into; similarly in the case of the inguinal and crural canals when the distending fat becomes absorbed in the general process of emaciation, they are left empty and lax; it is even conceivable that in the process of absorption the peritoneum would be still further drawn into the canal. These fat masses, being in most instances attached to the fundus of the sac, may escape notice during operations on herniæ when attention is directed mainly to the neck of the sac; it may also be supposed that the presence of a hernia in old-standing cases could cause the absorption of the fat which was really the pioneer of the hernia, or so alter it as to prevent its recognition. They are, however, often enough met with and recognised during operation, and should be kept in remembrance, for while to mistake the hernia for superficial fat could cause only inconvenience and delay, to mistake it on the other hand for omental fat, and attempt its removal or reduction, would be to expose the patient to one of two dangers, viz., wounding of the gut, or reduction of a strangulated

hernia together with the sac, the strangulated state not being relieved.

In the cases I examined by dissection, the mass of fat did not envelop a peritoneal sac, but it may do so. It lay only at the fundus of the sac, and in its centre was a mere fibrous core, probably composed of the sub-peritoneal fascia, or "fascia propria," in the meshes of which the fat had developed.

Fatty herniæ have been known to anatomists since before the days of Morgagni in 1745, and in 1810 cases were described by Pelletan with great fulness. He states that he could in every case effect reduction of the tumour, which certainly could not be done in all the preparations I examined.

Professor Annandale has drawn attention to the practical importance of recognising and carefully examining these fat-masses during operations for the relief of hernia; and Jonathan Hutchinson, jun., has compiled a large number of instances, and communicated his results to the London Pathological Society.

Tillaux and Cloquet also allude to the condition, the latter expressly stating that pressure from within or traction from without, or both combined, may prove the efficient cause of a rupture.

In size the fatty herniæ vary. In one case recorded by Prof. Annandale, the mass was of the size of a small orange. Usually, I believe, they are so small as to escape all notice during life, but a small doughy and badly defined swelling in a hernial region, not painful to pressure, and giving no impulse on coughing, should suggest to the mind as a possibility a hernia of sub-peritoneal gut. If cut down upon, the fat will be found to be arranged in large closely-packed lobules, covered by a delicate membrane. The specimens I have examined were all small, varying in size from that of a filbert to that of a large chestnut; yet they formed a series which, to my mind, illustrated very clearly the early stages of the process, and the mode of development of a true hernia as a sequel to it.

Prof. Annandale was sure that the members of the Society would congratulate and encourage Dr Douglas in connexion with his work upon this subject. Confining his remarks to fatty hernia in the inguinal region, he would remark that the one point of great practical importance was, that wherever the surgeon exposed a mass of fat in an operation for hernia, he should carefully break up the mass, so as to be sure that no hernial sac was contained in it. He referred to cases in which he had, in operating for hernia, met with small sacs surrounded by lobulated fat.

Mr F. M. Caird was interested in Dr Douglas's paper, and thought he did well in emphasizing the importance of extraperitoneal fatty growths in determining the formation of hernia in certain cases. One might compare the descent of a fatty hernia with the descent of a subcutaneous fatty tumour, seen in other parts of the body.

Mr Cathcart did not think the dragging-down theory was a probable one, because a larger and heavier mass of fat would have to be presupposed than seems to exist at the time when the action is believed to take place. Neither did he think that the condition was in any way similar to the pouch of peritoneum which precedes the descent of the testicle. He considered that the enlargement of the inguinal canal by developing fat, together with intra-abdominal pressure, would account for the association of so-called fat hernia with real hernial protrusions.

Mr A. G. Miller asked Dr Douglas how he could explain that contraction of the transversalis muscle opened the internal abdominal ring? Mr Miller thought that while undoubtedly the protrusion of a portion of fat might and did tend to produce a hernia, the existence of an opening in the wall of the abdomen might be the original cause of the existence of the extra and unusual amount of fat in that neighbourhood; in other words, the pad of fat might be one of Nature's efforts to close the opening.

Dr J. H. Stiles wished to add his appreciation of the valuable work done by Dr Douglas, as he thought that it was only by careful and numerous dissections of the inguinal region that new light could be thrown upon the important and difficult subject of hernia. From what Dr Douglas had told them of the formation of the hernial sac, it seemed that they ought to expand their definition of abdominal hernia to a protrusion of a constituent of the abdomen internal to the internal abdominal fascia, otherwise there would be a danger of confusing the terms fatty hernia and epiplocele.

Dr Douglas, in reply, said he had brought the matter before the Society because in his work several instances of fat herniæ presented themselves, and though previously cognisant of the condition, he had not recognised its importance. He thought with Dr Stiles that one's idea of the term "hernia" should be so altered as to include descents of masses of sub-peritoneal fat. With regard to Mr Miller's question as to the action of the transversalis muscle on the deep ring, perhaps the words "open the ring" were misleading; the muscle, however, in its contraction rendered resistant the inner pillar, and thus the outer boundary was more readily separated from it, and the ring became open. Mr Cathcart expresses doubt that a hernia could be produced by the traction exercised by the fat mass, or that such traction was exercised. At first the fat simply distended and filled the canal, but then by adhesion and increased weight it certainly, he thought, did draw on the peritoneum. Mr Annandale confirmed his observations as to the practical importance of recognising fat hernia, and his published paper on the subject gave one valuable hints. Though as yet he had not had opportunity to examine the condition clinically or at operation, yet such study

led one to believe that it might be possible to treat the condition before the true hernia had developed. The process during life naturally could be studied to ocular demonstration, and at death it was arrested; but if one found such morbid conditions as these recorded in his paper, he thought one might fairly conclude that they were stages in a continuous pathological process.

2. CASE OF INTESTINAL OBSTRUCTION SUCCESSFULLY TREATED BY LAPAROTOMY.

By A. G. MILLER, F.R.C.S. Ed., Surgeon to the Edinburgh Royal Infirmary. Reported by ALEX. MILES, M.B., C.M., Resident Surgeon, Lecturer on Clinical Surgery, Edinburgh School of Medicine.

In the course of my remarks in June last, during the discussion on Intestinal Obstruction in this Society, I reported five cases of laparotomy for intestinal obstruction, which were published in the November number of the Edinburgh Medical Journal. Since reporting these cases, all of which proved fatal, I have successfully operated on one patient, whose case I now beg to lay before you. The case has been written out for me by Dr Alex. Miles, who was my house-surgeon at the time.

Mrs D., æt. 60, housewife, residing at Edinburgh, was admitted to Ward XXX., Royal Infirmary, Edinburgh, on the 22nd August 1889, under the care of Dr Affleck. Her leading symptoms were intense pain in abdomen, and vomiting.

History.—The woman states that she has enjoyed very good health all her life, but has had very hard work, chiefly washing. She is the mother of fourteen children. She is habitually constipated, with occasional attacks of diarrhea, and sometimes colic. Three sisters died of phthisis.

Summary of present Illness :---

Aug. 21, 1889.—Strained herself putting clothes on to high rope; loose stool soon after.

Aug. 22.—Severe pain in epigastrium; vomiting.

Aug. 23.-Constipation; distension of abdomen; tenderness.

Aug. 24.—Operation ; internal hernia reduced.

Aug. 25.—Passed flatus mid-day. Temp., 98°6; pulse, 80. Aug. 26.—Patient wildly delirious. Temp. 98°4; pulse, 78.

Aug. 27 .- Quiet to-day; slight trace of faces in enema; wound dressed.

Aug. 28.-Improving.

Aug. 29.—Bowels moved to-day.

Aug. 30.-Wound dressed; deep stitches removed.

Sept. 2.-Dressed; all stitches removed; wound quite healed.

Sept. 6.—Patient got up.

History of present Illness.-The patient's present illness began by her having to go to stool on Wednesday afternoon, as the result of

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her having strained herself while hanging clothes on to a high rope. Her bowels were thoroughly evacuated, and after taking some tea she felt well enough to resume her work. While in bed about twelve midnight she was awakened by a severe pain in the epigastrium, which doubled her up. She had a strong desire to go to stool, but could pass nothing. She vomited occasionally. In the morning she took some castor-oil and opium, but she immediately vomited this as well as everything else she took. She continued to get worse, and was sent to Ward XXX. in the afternoon.

On examination the abdomen was found to be distended. It measured 28 inches round at the level of the umbilicus. It was tender to touch all over. There was no hardness or localized swelling on palpation. Under chloroform nothing abnormal could be felt per rectum or per vaginam, or bimanually. The rectal tube passed in for about 6 inches. About $\frac{3}{4}$ of a pint of warm water was all that could be injected; and when this quantity was thrown in the percussion note in the left flank remained unaltered. Purgative enemata, and castor-oil by the mouth, were given without result.

August 23.—Mr Miller saw patient with Dr Affleck, and recommended that the abdomen should be opened if the bowels had not moved by next morning.

August 24.—Further measures were tried without success. The patient was therefore removed to Surgical Ward No. 17 for operation.

In the afternoon the patient was put under chloroform, and the rectum was thoroughly examined. It was found to be very large and capacious. At the upper part the walls seemed to come together and form an obstruction, but by careful manipulation the finger could be got past this, and, when withdrawn, was stained with a yellow, soft, flakey material with no fæcal odour, probably the remains of some beef-tea enemata which patient had had.

The stiff rectal tube passed in about 12 inches, and was also stained with this matter. Only a small quantity of fluid could be thrown into the rectum.

Mr Miller then decided to operate at once. A median incision was made from the umbilicus to the symphysis pubis. On opening the peritoneal sac a small quantity of fluid escaped. On searching the left iliac fossa, the sigmoid flexure was found collapsed, and apparently in a state of spasm. The small intestine (ileum) was next examined, and one part of it was found to be much congested and distended. There was an adhesion of the omentum to the peritoneum, and a knuckle of bowel had slipped into the band thus formed, and become strangulated. The band was divided and the constriction relieved. Immediately the collapsed bowel, which was also in a state of tonic spasm, distended with flatus.

The bowel was returned, and the abdomen closed secundum artem.





August 25.—Patient better to-day; pain gone; still slightly sick; passed flatus by bowel at night; temp. normal; pulse 80.

August 26.—During the night patient suddenly became very restless and abusive in her language. She tried to get out of bed, refused to obey the nurse, and answered in profane and obscene language. It was now learned for the first time that patient had been addicted to the use of opium for some years.

She was therefore put on full doses of morphia given hypodermically, and by this means was pacified.

August 27.—Patient had still to be kept under the influence of opium. Took food fairly well. Wound dressed.

August 28.-Patient better to-day. Passes flatus freely.

August 29.—Patient still improving. Bowels moved freely after a large enema.

September 2.—Wound dressed. Found to be quite healed. All stitches removed.

September 6.—Patient got up to-day, wearing an abdominal belt. September 10.—Went home well.

February 4, 1890.—Patient came up to hospital to-day, and stated that she enjoyed good health.

There are two points in this case which I would like to remark upon—

1st, The fact that, while the obstruction was in the small intestine, it was impossible to inject the large intestine. This was apparently due to spasmodic contraction of the large gut. In this way obstruction of the large bowel was simulated, and was believed to exist.

2nd, The real cause of obstruction, an old adhesion of the omentum, and the passage of a portion of bowel between the omentum and peritoneum, could not have been positively diagnosed.

Perhaps I need hardly add that the case was one which could only have been benefited by laparotomy, and in which delay would have been fatal.

In determining to operate, I was guided by Dr B. W. Richardson's dictum, "because we are in the dark let us let in the light;" and in a case of intestinal obstruction the way to let in light is to open the abdomen.

3. THE PLACE OF SYSTEMATIC LECTURES IN THE TEACHING OF MEDICINE AND SURGERY.

By CHARLES W. CATHCART, F.R.C.S. Eng. and Edin., Assistant-Surgeon, Royal Infirmary, Edinburgh; Lecturer on Surgery, Edinburgh School of Medicine.

WE hear it often said that since modern text-books have become so numerous and so good, lectures on Medicine, Surgery, and allied subjects have become superfluous, and are therefore a waste of time. Consequently, in any school of medicine, especially a large one, it is important for lecturers to consider whether they exist (as lecturers) merely in virtue of customs and rules, which should now be abolished, or whether there are possibilities in lectures which nothing else can replace in the training of students of medicine.

Looking at the matter in its widest sense, we will be pretty safe to say that, for a learner in any subject, some sort of guide is better than none, and that a well-instructed personal guide is better than a printed one, especially at the student's outset, and over difficult and new ground. More especially does this seem true when the subject of study is concrete rather than abstract, when the senses have to be educated, and when the phenomena revealed to the educated senses have to be understood as well as observed. Moreover, the stimulus to thought and work which the personal influence of a teacher can infuse—the power of the human eye and charm of the human voice—can never be replaced by the printed pages of a book.

If this be granted in general, is it still true of systematic lectures in particular in contrast with clinical teaching? Before we try to answer this question, let us first inquire into the relative places of systematic and of clinical teaching and study. And by clinical study I do not mean sitting in a hospital theatre and taking notes of a disquisition on cases seen a long way off; but I mean the careful, deliberate, and personal study of separate cases in every detail-where methods of investigation are practised by the students themselves, who thus verify the facts of disease recorded. This may be difficult to reach in a large school, but it should be the goal aimed at. The aim for ourselves and for our students is a rational empiricism in the field of disease. The empiricism, or actual experience, can only be obtained by clinical study in its widest sense. The special training which alone can make empiricism rational cannot be fully carried out at the bedside, and falls to the share of general as well as of technical education, of which systematic lectures on Medicine and Surgery form an important part.

As I take it, then, if systematic lectures on Medicine and Surgery are to hold a place in the medical curriculum, their object must be to prepare the student's mind for the highest form of clinical work during his student days and afterwards. If this be so, it is fair to ask whether or not a lecturer can attain this, and if so, how? Let us see.

1. By trying to explain the broad, general laws of pathology which underlie many diseases, such as the essential nature, causes, and treatment of inflammation, the healing process and its hindrances, and the real meaning of special symptoms in certain systems, the reason for their presence in certain diseases and absence in others, and so on.

2. By discussing, comparing, and classifying diseases and groups

of diseases, indicating and explaining their chief symptoms, the general lines of treatment to be adopted, and the main points to be looked to in diagnosis.

3. By explaining, in illustration of the above, the principles carried out in the use of various instruments, by demonstrating pathological and anatomical specimens (fresh and in spirit), casts, and models, and by appealing to diagrams, photographs, and word pictures, and, where possible, to cases. For I can see no reason why fresh specimens and living cases, when they are available, should not be brought into systematic lectures.

By these means the student's interest will be excited, and his mental vision enlarged for his clinical studies.

But besides this positive view of what the lecturer should try to do, there is also the negative view of what the lecturer should try to avoid. There are three errors into which, as it seems to me, we, as lecturers, are apt to fall.

1. There is the error of trying to force into a student's mind, exclusively by memory, facts of disease which he can only really know when he has learned them at first hand through his own senses by the bedside. This error leads us to expand our courses to a wearisome extent, with great labour to ourselves and without corresponding profit to the student. Some rare diseases may, indeed, be left to description alone, but only because mere description is better than nothing.

2. There is the danger of *idolatry of means*. Putting representations of reality and stepping-stones to knowledge in the place of the reality and knowledge itself. In one form or another this error besets us at every turn in our schools of medicine. Diagrams, models, casts, special dissections, also analogies and parables, are, in their place, of the greatest service as helps or stepping-stones to knowledge. As soon, however, as they come to be considered as they often are—ends in themselves, they are harmful. The difference between their use and abuse is just this,—that their proper use is to lead the student past themselves to reality; their abuse inclines the student to be content with them alone.

3. There is again an error into which all teachers, systematic or other, are apt to fall,—that of idolatry of their opinions by themselves, and expectation of it from their students. This is "ex cathedrâ" teaching—trying to force into the student's mind, by influence of position, opinions which he can only really hold when they have come there by the logical processes of his own mind. So long as a teacher indicates the reasons for his opinions, no harm, but rather good, can come of stating them; but when he lays them down as if they were the final settlement of all vexed questions, he does his students' minds a great wrong. For the time being, perhaps, this system may seem to simplify the subject, but it weakens the student's powers of reasoning, it fastens uncertainties on him as if they were truths, and prepares the way, when the fallacies come to be exposed, for the student throwing overboard all that that teacher has ever taught him.

If the view I have taken of the scope of lectures and the method of carrying them out be a correct one, we can now return to the question which we left, and consider whether printed addresses at home could replace the spoken ones in the lecture-room. My answer is, No; because, while many stepping-stones to knowledge, *i.e.*, demonstrations of instruments, of specimens, casts, cases, and diagrams, as well as the stimulus of the human voice and presence, would be lost to the text-book reader at home, the danger of raising such as he had (diagrams and word pictures) into the position of idols, as well as of learning by rote, would be greatly increased. Some of the simpler and more generally accepted parts of the course may indeed be left to text-books. Then, however, the student's knowledge should be tested by oral examination in the lectureroom, and further explanation made if necessary. I would therefore deliberately conclude that, in the highest training of students of Medicine and Surgery, systematic lectures should be continued, since nothing else can take their place.

Let us see, however, if, apart from the errors already alluded to, our methods of conducting such lectures are as perfect as they might be. My remarks here may be grouped under two heads— Note Taking, and Seeing.

1. Note Taking.-In spite of a contrary opinion which is held by many, I am strongly persuaded that the laborious note-taking common in some schools of medicine is a bad system. To go into one of the classes where note-taking is rife, one would fancy one's self in a schoolroom at the dictation lesson. Most of those present seem like living machines for changing spoken into written forms of speech. Their reasoning faculty is subservient to the drudgery of trying to catch the speaker's words and meaning, and at the same time to compress it, so that in longhand they may keep pace with the lecture. Should they by vigorous shuffling and other signs of displeasure get the whip hand of the lecturer, and force him to slacken pace when he gets beyond them, then the lecture must be robbed of the charm of the speaker's individual manner and mode of expression, and of all the mental stimulus which that might have brought. Even if the lecturer takes his own natural way of expounding his subject, he must be chilled by the benches full of bent-down heads and scribbling fingers, knowing that all his energy, fire, enthusiasm, and logic is passing in at the ears and out, more or less mangled, at the finger points. By this system the students cannot follow a train of thought with individual and critical attention. Even the bare facts are seldom recorded correctly. The real work of learning must be done at home from the more or less imperfect abstract of the lecture to be found in the note-book.

It is claimed for this system that it maintains attention, furnishes the student with the lecturer's opinion on subjects on which he may be a special authority, and trains the student in making abstracts.

To these arguments I would answer that the lecturer's opinions on important points may be conveyed to the student in other ways, and that the power of making abstracts is bought at too high a price when the process involves a diversion of the student's mind from the subject discussed.

Again, the system of writing an abstract of the day's lecture on the black board is not good. The abstract, if full enough to be of service, will be copied by the student when he should be attending to the lecturer. If short enough to be rapidly copied, it will be too meagre for the purpose in view.

The only system which seems to me to meet all requirements is that of supplying full abstracts prepared by the lecturer beforehand, and given into each student's hand. Mere headings are not enough. An abstract of facts and arguments is wanted. The lecturer may then freely invite the student to give his whole and undivided attention to the subject, adding only a note or two here and there. At home he will be able to spend more profitably the time he would otherwise have used in deciphering his notes, in recalling the lecture, and adding to his notes, as seems advisable. A plan very like this was employed by the late Rev. Dr Chalmers many years ago. Professor Grainger Stewart has, I understand, carried it out, formerly as an extra-mural lecturer, and now as a professor. Both he and Dr John Duncan devised it independently, the latter having also employed it until he left off systematic lectures. An increasing number of lecturers are now adopting the same system.

Were this principle systematically employed by all lecturers, the gain to the taught would be very great. For large classes printing would be necessary, but there the expense would be of less account. For classes of 50 and under, the cyclostyle answers admirably. Alterations would be necessary from year to year, but not every part would require alteration each year.

2. Secing.—The great importance which has been hitherto given to note-taking has influenced the construction of all our lecture-rooms and teaching theatres. The seats have been arranged for convenience in writing, not for facility in seeing. The result is that only those in the front rows of our larger theatres can see anything which requires near vision, and the demonstrations to those in the back benches are a simple farce. Were attention paid to seeing, theatres might be put up so that the students could be heaped round the lecturer. By going in turn to different parts of his theatre the lecturer might give really serviceable demonstrations of his specimens to 50 or 60 students at a time. To more than this number one man cannot reasonably demonstrate, but where the classes reached to twice or thrice that number, several demonstrators might be employed, and a part of the lecture hour given up to the demonstration of illustrative specimens in succession to different groups of students.

In conclusion, therefore, while deprecating the abolition of systematic lectures on Medicine and Surgery, I would urge a recognition of their proper sphere, and advise improvements such as I have indicated on the previous methods of carrying them out.

I would also suggest-

1. That bedside teaching, as distinguished from and in addition to clinical lectures, should be considered to be as important and as imperative as systematic lectures, since this bedside form of teaching can alone give real personal knowledge of diseases.

2. That courses to junior and to senior students, especially in Surgery, should be kept separate, say 50 to juniors and 50 to seniors. This would save the time of both.

3. That the plan advocated in the Students' Representative Council Report of permitting class meetings to be ranked equally with lectures be carried into effect in the regulations.

4. That in other departments of medical study the same general principles should be applied which have been here advocated.

Dr Berry was sorry he had not heard the whole of Mr Cathcart's paper. The subject was one which had long interested him. He considered that compulsory lectures on medicine and surgery were an anachronism. He recognised the difficulty in interfering with vested interests, but still could not but feel that what was wanted was an extension of clinical teaching, and a more searching system of examination. He found that in many of the Continental schools attendance on systematic lectures on these subjects was not compulsory. In the Scandinavian schools, for instance, systematic teaching was to a great extent combined with a tutorial system, and the attendance on such was optional on the part of the students. Such a system, he thought, might with advantage be extended in our schools.

Dr James Ritchie said that education should be from the general to the particular; that it was important to have an idea of the whole field of study to enable the relations of portions to be appreciated. A systematic course gave that general idea. The first cases of any disease which were seen made a more profound impression than the subsequent ones; it was rare to find two cases presenting the same features; peculiarities were common; and it was important that a man should have first impressed on his memory that which was typical in any disease rather than the peculiarities of cases. A systematic course taught the typical; clinically one learned the modifications produced by the individual. Those who desired to abolish systematic courses might go thus far; but they said that, as

systematic text-books were so good, the student might as readily acquire a knowledge of the subject from them. Educationalists were agreed that as many as possible of the senses of the pupil should be engaged. Although impressions of sight were more readily recalled than those received through the other senses, it would hardly be asserted that impressions by letterpress were so readily recalled. In reading only one sense was engaged, but in lectures both sight and hearing; and lectures were more copiously illustrated by diagrams, specimens, etc., than any text-book. In the class-room, that indescribable something, which they called sympathy of eager fellow-students, was more conducive to concentration of attention than were the adjuvants of a sitting-room in lodgings. A good teacher would also inspire his students with enthusiasm for the subject, which would render the memory more receptive than it would be in reading; a good teacher would in two minutes demonstrate a diagram or specimen, and with more benefit to the student than he could attain after a much longer time of reading; a good teacher would, by inflections of his voice, convey an impression of importance in relation to certain portions of his subject which no combination of italics nor of small capitals in letterpress could do. The repetition in consequence of lecture on and reading of the same subject at home, instead of being a disadvantage, was of the greatest importance. Some facts were at once indelibly fixed in the memory, but it was otherwise with the most. These might require to be repeated again and again before the impression remained, and even before their full significance was appreciated. In a systematic course it was possible to have a view of the whole field of study, but this was not possible in clinical teaching, because even in large hospitals many diseases were rarely or never seen, and these were by no means those diseases which were of least importance in actual practice. Dr Ritchie desired to say, in passing, that there was urgent need for some rearrangement whereby the student might be able to bestow more attention to dispensary work; he thought, also, that the out-patient department of hospitals should be more utilized. He was opposed to multiplication of systematic lectures on the same subject. He thought that the question might pertinently be asked, What was a clinical lecture? To introduce a patient to a large class, to point out a few features of the disease from which he suffered, and then to deliver a systematic lecture on that disease, was not a clinical lecture. Clinically, disease ought to be approached from the symptomatic side, and the student should be brought as far as possible into practical relation with the patient. He thought that the whole arrangements for clinical lectures should be revised. Dr Ritchie thought that each systematic course should, as far as possible, be a complete one; that the teacher should not aim at cramming into the student's memory the sum of knowledge which had been acquired regarding each disease, but to convey only the most

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important features, some in more detail, others in outline, leaving a considerable amount to be filled in by the clinical teacher.

Professor Annandale remarked that it was always pleasant to find enthusiastic young teachers bringing forward their views upon medical education. He was of opinion that students, before commencing the study of medicine and surgery, should be obliged to have passed their examinations in the preliminary subjects. If this was done, the student's mind and time would be free to study medicine and surgery. He approved of limited and condensed systematic lectures, and he also approved of some reform in clinical teaching, in the direction of more bedside work.

 $Mr \ A. \ G. \ Miller$ remarked on two points. In regard to the student's system of too close note-taking, he agreed with Mr Cathcart that it was bad for the students, and very unpleasant and inconvenient for the lecturer. He considered that the practice arose from the students' fear that they would not pass their examinations unless they were able to "get up" the *ipsissima* verba of their teachers. There was another point—to which Mr Cathcart had not, however, referred—which was an evil, viz., overlapping. For example, in the subject of inflammation, students got the physiological, pathological, medical, and surgical aspects dinned into them by so many different teachers till they were quite sick of the subject, and generally thoroughly confused.

Mr Cathcart briefly replied.

Meeting VI.—February 19, 1890.

Professor A. R. SIMPSON, President, in the Chair.

DISCUSSION ON THE PHYSIOLOGY OF EDUCATION.

Dr John Strachan, Dollar, in opening the discussion, said,— If an apology were needed for introducing in a medical society a subject dealing with the work of another profession it would be sufficient, I think, to point to the intimate connexion so frequently found to exist between the school work and the ill health of children. A few years ago a parliamentary commission, appointed to investigate into alleged prevalence of over-pressure in English schools, reported that a number of cases of serious illness, and some of actual death, had undoubtedly been caused directly by school work. Most of us could point to similar cases, which may well be regarded as very extreme, and are to be estimated, not by their number but by their significance, as indicating a certain tendency in school life. There are many degrees of injury short of death. The occurrence of even one death or serious illness, caused directly by school work, is sufficient to stamp that work as in some way inconsistent with the laws of health, and to suggest the existence of much evil in connexion with it, which may never come to the knowledge of the public. In medical practice we have all frequent occasion to observe close relation between prize taking at school and pale cheeks, poor appetite, headaches, sleeplessness, and other indications of deteriorated health, with a tendency to nervous affections at the time or in later years. These and other facts which might be mentioned fully justify the inference that school procedure runs upon unsafe lines, and that the danger to the pupils is in proportion to the pressure under which it is driven.

If we seek an explanation of such a state of matters we may find it sufficiently indicated by Prof. Bain of Aberdeen in his book Education as a Science. In that book of 438 pages the "Bearings of Physiology" are disposed of in less than three pages. In these we find the following passages :- "The Science of Physiology is quite distinct from the process of education." "The art of Education assumes a certain average physical health; and does not inquire into the means of keeping up or increasing that average." "The inquiry must proceed upon our direct experience in the work of education ; with an occasional check or caution from the established physiological laws." The assumption here is that education has to do with something apart from, or only loosely associated with, our physical being, which is looked upon rather as a hindrance by "occasional checks" of the kind I have just referred to, than as having any direct bearing upon the work. It is scarcely necessary to point out to this meeting that, apart from moral training, education has to do entirely with brain action, which is as purely physical as is the action of any other organ of the body. It is the result of physical growth and development, is kept up by nutrition and blood change in the part, is subject to fatigue, and is directly affected by injury and disease. Instead, therefore, of physiology being distinct from education, it is the basis upon which all true and safe educational procedure must rest. It is true and may be right that the teacher does not inquire into the means of keeping up the health of his pupils, just as the builder may not trouble himself about the principles of architecture upon which his plan is drawn. It is essential, however, that the builder's plan be correctly drawn upon sound principles, otherwise his work is certain to prove a failure and a danger. The medical profession, as the only recognised authorities in physiological law, are or ought to be in the position of architects in educational procedure, and it is for them to lay down the plan upon which the practical educationist may work with safety. If they neglect this duty, it is certain to be neglected, as no one else is in a position to take it up. It is for such a meeting as this to consider how far responsibility for educational failure and disaster may be held to rest upon our

shoulders, and also, perhaps, how far the physiological knowledge of our profession should be applied and paid for by the State.

Without occupying your time with further preliminary remarks, I shall endeavour to give a very brief sketch of the physiological facts and principles which I consider ought to rule in all educational procedure; after which I hope the question will be taken up by some whom I see present much better qualified than I am to speak with authority on the subject.

Whatever views may be held with regard to the abstract principle of mind which it is the special province of education to cultivate, there can be no doubt of the fact that mental action is entirely dependent upon the mechanism and functional power of the brain. The primary object of education must, therefore, be to secure a well-grown, well-developed, healthy, and vigorous brain as the foundation upon which to rear a well-furnished and welltrained mind. If there were really any antagonism between these two objects, which there is not, the former ought to have the preference. A strong, healthy brain will do much to educate itself, and will be thoroughly effective so far as its knowledge goes; whereas a weak, ill-developed brain will be weak in thinking power, however stuffed it may be with verbal learning.

The first point to be considered with regard to the brain of the child is that it is immature. From the embryo it has made enormous strides in growth and development, and at the commencement of school life has advanced a long way in knowledge and intelligence. It is yet, however, far from complete, and the processes of growth and development, along with the acquisition of knowledge and ideas, are still actively going on. Upon these must entirely depend ultimate brain power as applied in mental action; and it is to them, as the physiological basis of education, that I wish especially to direct your attention.

Growth is a continuous process, and to attain to the highest results it must go on smoothly and uninterruptedly from birth to maturity. It no doubt varies considerably at different times, but each day and each hour adds its special increment to the growing organism. The ultimate result is the complement of each day's addition during the period required to complete the human frame. This period has a certain *fixed* limit, when no further addition can be made. For complete growth every hour up to this point must be fully utilized, and any interruption of the process is so much deducted from ultimate size and strength. In the transverse section of a tree we can examine, in the concentric circles caused by the winter's cessation, the result of each year's growth. A cold, unfavourable season is indicated by a thinner circle, which is a curtailment to the same extent of the ultimate size of the tree. A similar evidence of defective growth may be seen in the part of the finger nail which has grown during a severe illness, and which is distinctly thinner than the rest, forming a mark of value sometimes in a medico-legal sense. A like defective growth causes the hair to break off by the part which has grown during an illness, when it is supposed to be coming out. So in the whole animal or vegetable organism growth is at all times in accord with the conditions, favourable or otherwise, under which it takes place, and the final result corresponds with the sum of such conditions. Defective nail growth is in time cut off and got rid of, and the hair grows again. It is not so with the brain. Defective growth there means, as in the tree, curtailment of ultimate size, inappreciable by our senses, but having its effect upon the mental powers.

But size, as we know, does not necessarily mean strength, and something more is required than mere growth. Concurrently with growth another process goes on in the young, which we may call functional development. This gives functional vigour and stamina to organs which otherwise, although large, might be feeble and languid in their action. It is essentially a process of youth—spontaneous, continuous, and progressive during the whole preparative stage. Along with growth it determines the ultimate attainable strength of the mature organ. For complete development every day must add its full quota to the growing organ, and anything short of this is so much detracted from the final result. A primary object in true education must thus be to maintain, continuously and in the highest degree possible, the conditions necessary for healthy growth and development. Let us now consider what these conditions are.

First must be placed the maintenance of full health and vigour of the system. The animal body is a typical commonwealth, where each part performs its own special work in the vital economy, where all work together for the welfare of the whole, and where one cannot suffer without all being more or less affected. Much as it may be our object to pay special attention to the brain, we must not the less, but the more attend to the healthy action of all the organs of the body, without which the brain cannot thrive. A factor of great importance in education is abundance of free and hearty exercise in the open air, without which the system must more or less languish, and growth and development be defective.

Looking now at growth, we must consider it mainly in relation to food supply. Growth may be regarded as the process of building up the animal frame with the plasma derived from the food. But as food eannot be utilized for this or any other purpose until reduced to the condition of chyle, the supply will depend upon the powers of the digestive organs as much as upon available food stuff.

After the maintenance of life and heat, the first demand upon the food taken by old or young is to supply the place of waste consequent upon action. Any failure in this respect entails emaciation, weakness, and disease. In the adult this process of repair, along with combustion and storage of carbonaceous matter, are the only demands upon the food supply. In the young, however, over and above these immediately essential purposes, food is required to provide building material for growth, and the quantity taken requires to be to that extent greater, in proportion to size and activity, than in the adult.

Any deficiency in the food supply, or what amounts to the same thing, any excessive demand for repair consequent upon overaction, must be at the expense, in the first instance, of growth, which, having reference only to the future, is less urgent at the time,—growth must be completely starved before repair and with it health begin to suffer. What is thus true, and frequently observed with regard to the body as a whole, must be equally true of individual parts or organs which may be affected separately. These can only receive their share of the whole nutrient supply, which share, although determined to some extent by relative activity, is a limited quantity. Any excessive demand for repair must be met out of this quantum at the expense of growth and ultimate development of the part. Should nutrition be insufficient to supply even that demand, then, besides entire cessation of growth, the part will be weakened and injured.

The great importance of an adequate food supply for effective education is now being recognised, and steps taken to meet the most pressing needs. Food stands in relation to instruction as the building of a house does to the furnishing of it, and ought, one would think, to be a prior consideration.

It is very possible, however, for children to starve, as regards growth and future physique, in the midst of plenty. If the digestive powers are weak, an abundance of food is of little avail, and the child of the well-to-do may be in as poor a state as the most poverty-stricken wastral. The maintenance of a hearty appetite and good digestion ought to be looked upon as a first object in education, and all school procedure which tells against this is *anti*educational.

Functional development depends upon functional activity, which, so far as it tends to development, we may call *exercise*. Beyond that point it becomes STRAIN, and injurious to health. *Duly regulated* exercise is essential to the proper development of every part of the organism, and the ultimate attainable strength of each, in relation to organic structure, is determined by the extent to which it is thus exercised during the whole period of youth. Any part which receives no exercise (as is often the case with the muscles of the scalp and ears) is altogether lost as regards functional power, and all deficiency of exercise entails a corresponding defect in the strength of the part concerned. On the other hand, excessive exercise will produce excessive development at the expense of growth, with present increase of functional power, but ultimate organic weakness. This is seen where, as in mining
districts, boys are put to hard labour. As boys these are abnormally strong, and have the appearance rather of little men. Nature, as it were, finding the strain upon the organism incompatible with the continuance at the same time of growth and health, chooses to sacrifice the former so as to save the latter. She thus hurriedly winds up her unfinished work, and adapts the young organism, as best she may, to the adult conditions imposed upon it. In such districts the men are found to be of small stature, poor physique, and short lived. What is thus demonstrated in the case of the body is equally true of the brain and mind. Any part of the mind (and there are many parts) which is insufficiently exercised in youth must be correspondingly weak in after life; while any part which is exercised to excess will be abnormally strong at the time, at the expense of growth and organic stability of the part of the brain from which it is evolved, with ultimate weakness and a tendency to early decay. It is difficult here to illustrate the effect of insufficient exercise, as such defects as would result are usually set down to individual peculiarity; but with all respect to our guests of the teaching profession, I would suggest that the restricted range of mental exercise prescribed by the school, and the comparatively little time or opportunity allowed for any other, must have the effect of narrowing the scope of mental development. The premature development consequent upon excessive mental exercise is witnessed in those young persons who work hard for school prizes and competitive examinations. They want the brightness and animation of youth, and have an abnormally thoughtful, careworn expression of countenance,-are, in short, mentally, little men and women. It would not be difficult to instance numerous examples of the further analogy of later years. when the mind breaks down more or less on the very threshold of its life's work, and is worn out when it ought to be at its strongest. Such cases are probably within the experience of all of you. They are freely cited by most with whom I have had occasion to converse on the subject, more especially in reference to the Indian Civil Service examinations. These are designed to test, not qualification for the work in prospect, but simply the powers of endurance of the candidates. They are no doubt a means of selecting those who are strongest at the time, many of the weaker breaking down under the strain of preparation; but they are also a means, according to inexorable physiological law, of preventing them from being strong in the future.

For the attainment of full power of any part, physical growth and functional development must go hand in hand, each, as it were, waiting upon the other. Exercise, while full, must use up no more than its share of plasma, *leaving the due quantum to be* vested in growth for adult use. To whatever extent this correlation of activities is departed from, so far will ultimate power come short of what it might have been.

We come now to the question of how the educator is to judge of these complex requirements and conditions of healthy growth and development, so that, while seeking to instruct and train the mind, he may secure good brain power to give due effect to his instructions. How is he to regulate brain action, so that it may be at all times in due relation to nutrition and the requirements of growth? Sir Lyon Playfair, on behalf of the authors of "the Code," professes to have gauged the powers of the average child, and thus adapted the requirements of "the Standards;" but he does not condescend upon particulars as to how they arrived at their conclusions. The question, however, is not one of attainment, but of school procedure. It matters little how high the standard at which the teacher may aim, so long as he employs only right methods in seeking to attain to it; whereas with wrong methods much harm may be done, with very poor educational results. must be evident that age and apparent strength are no adequate or safe guides in this inquiry. Besides the many degrees of mental power as a whole, of which no estimate can be formed from outward appearances and the great variety of bent or speciality of power in different minds, many circumstances modify the determining conditions from hour to hour. Previous action, both mental and bodily, the time of day or night, the state of digestion, emotional feeling, slight ailments, etc., have an important bearing upon the action, suitable at the time, and require to be allowed for in regulating exercise. Then the multiplicity and extreme complexity of the mental powers must be taken into account, and care taken that all receive due consideration. Were the regulation of mental activity left to the arbitrary will of the teacher, what chance would there be of all these conditions and considerations being duly observed? Fortunately there is another educator in the field, one who has all the knowledge and power which are of necessity wanting in the schoolmaster. After forming a human being in embryo, and bringing it through all its stages to the period of school life, Nature does not retire from the field, and leave the work to be taken up and completed by another. The provisions which have succeeded so far are still in force, and no less efficient for the future.

All our organs are of necessity automatic in their action; and almost all perform their functions, and look after their own wellbeing, without our consciousness or our being able to control them in the slightest degree. Only such as have external relations the stomach, the muscles, and the mental powers—are in any way subject to the will, and these only as regards such relations. With them activity is automatic and self governing as with the others; and the duty of the will is simply to guide and direct these activities in accordance with external relations. Organic conditions and requirements are intimated to the will, and the rule of the will is dominated by *instinctive feelings* springing directly from the part concerned. These may be classed as desire and pleasure, prompting to, and discriminating action, on the one hand; and repugnance, satiety, fatigue, and pain, preventing or checking excessive or otherwise injurious action on the other. These instinctive feelings are a *perfect* index to organic and functional conditions and requirements at all times and under all circumstances. They are a necessary equipment of the animal organism, and throughout the whole animal kingdom are thoroughly effective in securing required conditions of life, however various or complex these may be.

In the young instinctive promptings are modified in accordance with the educational system designed and instituted by the Great Teacher, having reference not only to present health and wellbeing, but also to preparation for the coming life. They thus indicate not only the amount of food required to meet the immediate requirements of vitality and repair and actual power according to available nutrient supply, but also the additional nutriment required for growth and the relative proportion in which plasma ought to be applied to repair and growth. It is to them that I would direct the teacher for guidance in the otherwise impossible task of properly regulating activity in the young. In any case he must lay his account to deal with them, as they are there, and cannot be got rid of. They are as much a part of the child as are his limbs or his senses. They are there, however, for a purpose, which is the same as that which the teacher is understood to have in view, apart from examinations. Like the law of gravitation, they are either a help or a hindrance, according as they are with or against us. Activity as prompted and regulated by instinct needs only to be aided and directed in order to produce the highest results. The teacher may substitute his will for that of the child in directing activity, but in doing so he must follow the indications afforded by the child's feelings since his own do not apply.

I need say nothing in support of this view as regards the body, since the complete efficacy of these natural guides is amply demonstrated wherever the young are, under favourable conditions, left to follow the dictates of Nature. In a general way it is acted upon in the management of children, so far as the supposed requirements of mental education will allow. We may then assume as granted, that in the taking of food and bodily exercise the *inclinations* of the child, as prompted by instinct, are the best or only guide. Let us see how the analogy bears in regard to the mind.

We have first to note that mental activity is there in full volume. Prominent as is action of the body, that of the mind is even more constantly present in the waking hours of the child. It is an essential element in all games and amusements, whether or no these be accompanied by bodily exercise, and it is manifest in every word and act. It wells out as water from a spring, and like

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a stream, while impatient under restraint, it readily turns into channels which favour its natural flow. In any case the teacher has it to reckon with. If it be not with him it will be against him and, for good or ill, it is an ever present and effective force.

When we analyse this activity, we find that it is of two kinds, viz. :--1st, The acquisition of knowledge and ideas as evidenced by keen observation, prying curiosity and frequent questioning, along with the immense store of knowledge of common things, which is amassed without the aid, and notwithstanding the monopolising tendency of the school; and, 2nd, exercise of such knowledge as is possessed in play and amusement. Each is prompted by instinctive impulse directly connected with organic conditions, entirely analogous to those prompting the taking of food and bodily exercise. Analogous, too, are the objects sought to be attained, viz. :--Furnishing the mind with the pabulum that thought is made of, and without which there can be no mind; and securing for this the exercise and training required to render it efficient in the future. Is there any reason for withholding from mental activity, so prompted, the confidence we are so ready to place in analogous bodily activity? Do we know so much more of the psychical action of the brain than we do of the action of the stomach and of the muscles, that we can afford to dispense with or oppose natural indications in the one case, although we, admittedly, cannot in the other? Are not the facts very much the other way? And is it not because we know so little that we presume so much?

Let us look at the two forms of mental activity so prominent in the child, and see how far they may meet the objects of education.

The child craves for knowledge not less ardently than he does for food; and, of his own free will and pleasure, imbibes all the information to be obtained from the every-day life of the community in which he lives; besides acquiring a fair command of at least one, sometimes two or three languages. No one who compares the knowledge and intelligence of a child six years of age with those of the same child at one or two can doubt the exceeding vigour and efficacy of this receptive mental activity, or dispute the existence of a natural desire or appetite for information. The question is whether this appetite is sufficient for the purpose of the teacher? What is this purpose? To supply the young mind with knowledge of a kind which without his aid the child would have no opportunity of learning. Very good ! And how does he propose to get the child to accept of it? What difficulty, when the appetite is there ready to imbibe any suitable pabulum which may be placed before it? But the teacher may tell us that he does not find this appetite incline the child to learn grammar rules, Latin exercises, and other articles of conventional school diet. This, however, reflects upon the form of the rules, etc., rather than on the appetite. The appetite for food does not incline the child to eat raw potatoes, but we do not on that account employ means to force

raw potatoes upon him, however nutritious they may be considered. We boil the potato, and do it up in some palatable form, when it is eaten readily and with pleasure. So ought the teacher to present his grammar rules and all other pabulum with which he seeks to feed the child's mind in such form as will engage the interest, when it will be learned with pleasure. With regard to this, I would say that the printed word can never be the best form in which to present knowledge to the child's mind, being as yet unfamiliar, and requiring a distracting effort of mind to follow the The spoken word, which has been familiar from meaning. infancy, and goes direct to the mind, should always be used, and supplemented, as far as possible, by pictorial aids. It is as reasonable to suppose that digestion is improved by giving indigestible food as that the mind is strengthened by rendering learning difficult.

But as even boiled potatoes may be unsuited to the infant stomach, so there may be mental pabulum which no amount of cooking will render intelligible, and therefore interesting, to the young mind. The only sensible way to deal with such is to leave it till the mind is sufficiently advanced to receive it with interest. To force it earlier upon the memory is both useless and injurious. Again, the utmost efforts of the teacher will fail to keep up the interest of his pupils for hours together, just as it would be impossible to keep up the appetite for food with a like continuous feeding. The receptive powers in either case are limited, and the only possible indication in this respect is the appetite. But the teacher may tell us that this appetite is not nearly sufficient for his purpose, and that the child requires to learn much more than he is inclined for. So might one say with an arbitrary method of feeding, which prescribed food upon some empirical rule, without reference to taste or appetite. We know that the result of such feeding would be to injure the stomach and starve the child. So it is with a like method when applied to the mind. Far less knowledge is really imparted with this empirical stuffing than might be with teaching conducted upon strictly natural lines.

Those who reject the appetite as a guide to instruction ought to be able to state what other indications they profess to follow. Or will they tell us, in so many words, that they require no indications other than their own arbitrary estimate of what the child ought to be able to learn, and which they can force him to learn? Is the implanting of knowledge in the human brain such a simple affair that it can be dealt with in this rough and ready, this brutal fashion? Such a statement would, in the light of physiology, carry with it its own condemnation, and the condemnation also of those who made it as unfit to be entrusted with the management of the growing human mind.

The acquisition of knowledge is but a part, and by far the smaller part, of spontaneous mental activity in the young; the other part, which embraces all their play and amusements, being exercise of the knowledge already possessed.

The idea, or item of knowledge, when implanted in the mind, seems to exert a modifying effect upon certain of the brain cells, which thereupon assume the nature and character of an organ having the evolution of the said idea as its function. This I look upon as the psychical unit, the aggregate of such ideas, acting together, and manipulated, so to speak, by the mental faculties, constituting our intellectual powers. Each idea is thus organic, and subject to organic laws. It requires exercise for development, and to keep it strong and vigorous; but this must be duly regulated in accordance with organic conditions at all times. Such exercise is prompted by instinctive impulse, and accompanied by feelings of pleasure, just as with the muscles. Hence the perpetual mental activity of the older child. In the young child where ideas are as yet few, this spontaneous exercise is the more easily studied. It is then seen that, while anything appealing to existing ideas, as the shaking of a rattle or the springing open of a watch, excites pleasure for a time, the child soon tires of it, and the same amusement will not be again effective till after a period of rest. Great part of the young child's time is spent in sleep or in mental apathy, there not being ideas sufficient to fill up the whole day. In the older child, again, ideas have become so numerous that they cannot all find time for the exercise they would willingly take, and it becomes, to some extent, a matter of selection and survival of the fittest. Still, the exercise of each, however it may come short of, must never exceed that suited to its organic condition at the time, otherwise the organism will be injured and weakened for the future. This regulation of activity is amply provided for by inclination, just as with the individual muscles; and as with the muscles, so with the ideas and mental powers, the tendency is to full development of the whole. The office of the teacher in this respect is to aid and direct activity into the most useful channels, on the principle that the parts of the mind most exercised in this way will be strongest in the future.

You may have observed the absence in this paper of all reference to the subject of memory, which, as a rule, bulks so largely in school work. The reason is that I do not look upon memory as, properly speaking, part of the mind, but mainly a record of sense perceptions, having only an incidental connexion with our thinking powers. I was sorely tempted as I wrote to bring in my views on this subject; but having regard to your time and patience, I thought it better to deal with memory as I think it ought, in the main, to be dealt with in education—leaving it out altogether. I could, of course, give reasons for this, but shall spare you for the present.

I have endeavoured in the time at my disposal to put before you what I take to be the basis of the true science of educationthe natural process of preparing the young mind for the coming life. I am convinced that in the careful study and strict observance of this lies a great future for the teaching profession, as well as a happier and a better time for children and for the nation.

The attitude which, I think, ought to be taken up by the medical profession in the matter is to insist upon the total inadmissibility of punishment and prizes as applied to mental work in the young. The only object of such, as it is their only effect, is to overcome instinctive promptings-to induce the child to do what Nature tells him is wrong. There can be no safety in any system of which they form a part, any more than if the same were applied to the taking of food. Deprived of this means of forcing unsuitable, and therefore repugnant, because injurious work, upon his pupils, the teacher would be obliged to fall back upon the natural action of the young mind and adapt his method to that, when a beginning would be made in scientific teaching. Then, and not till then, will payment by results be a safe and justifiable measure. As at present applied, the teachers themselves cry out against the iniquity of the system, declaring that it necessitates on the approach of inspection time an injurious amount of pressure upon the more backward pupils; and I know well, from personal observation, how much this is the case. So long as this is understood to mean only a little temporary suffering, or even illness, with compensating benefit from increased knowledge, it is not likely that even the Society for the Prevention of Cruelty to Children will concern themselves in the matter. But if it were distinctly stated and pressed upon the authorities by the medical profession that such pressure, and all pressure upon the delicate organism of the growing brain, is directly opposed to the objects of education, and certain to weaken the intellectual powers of the rising generation, then it might be hoped that something would be done to place the school system on a more safe and satisfactory footing.

Dr Clouston said it might be useful to lay down general principles in regard to education that would be accepted by both physiologists and by educationalists, and then in the application of these to try and find out their differences, if they had any. Was not education the guiding of the process of development? Would not the physiologists and the educationalists both agree that this was a reasonable definition of it? If so, would they not both agree, too, that this guiding process must be conducted with reference to certain leading and essential principles? The chief of these seemed to him to be :- First, It must be conducted with reference to the potential power of each organ of body and each faculty of mind of each individual to be educated. This potential power could not be estimated except by taking into account the heredity as well as the things that can be directly tested by observing children. They all knew that every fond mother and every ambitious father firmly believed that their son was capable of doing any-

thing in any direction if only they could get a schoolmaster clever enough to understand him and train him rightly. The parents far more than the teachers failed to estimate the true potentialities of children and their limitation of power in all directions. But the teachers must make an attempt to please their paymasters. The parents might know, but wont, and the teachers had not the means of knowing the weak parts in heredity and constitution of the pupils. Second. It was essential that the educational process should have reference to the chief work to be done in life by the person to be educated. Was this to be handicraft, or commercial or professional duty? To apply the same process for all these would be ridiculous. Third, It must have reference to the two great and primary instincts of preserving life and of reproducing life. It must not hurt the health, and it must not lessen or render specially difficult or dangerous the process of reproduction; nay, it must not diminish the desire to reproduce. This applies most strongly to the female sex. They must on no account sanction any educative process that produces bad mothers. The future of the race depended on this. Their efforts should be to make our women intelligent and useful members of society, as well capable progenitors of future generations. Motherhood as should be the highest delight of every healthy woman, and anything that lessens that delight must be contrary to Nature's law. He believed the two things were perfectly compatible. But to make them so the teacher must come to the physiologist and the doctor for guidance in his principles and in his practice in female education. Fourth, The educative process must have reference to the happiness and the capacity for enjoyment of the individual to be educated. And this could not be dissociated from his health. He could not quite go so far as Dr Strachan in advocating a purely natural process of education. He believed in the teachings of experience, and surely schoolmastering had not been conducted on entirely false lines for thirty centuries. What it needed was to get itself tempered by the physiological knowledge of the present day. It was doing so in many ways. Look at the systematic games, the shortened hours at a stretch, the airy class-rooms, the diminished floggings, the more careful study of individual capacity and peculiarity, that they would find in every good school, and increasingly prevalent; look at the special arrangements for studying classics, science, and commerce; look at the means of cultivating observation-the school museums and the botanical excursions; look at the school cadet corps-all these things showed progress on rational lines. But this progress had been more for the boys than the girls. Let them insist, so far as they could, that the girls get the full benefit of the same advanced ideas. They needed them even more than the boys. Unfortunately women in advocating women's rights had not always put in the forefront of their claims the primary right of the sex to the

capacity for easy, safe, and pleasureable motherhood. Let them not neglect this in the future. It lay at the root of every woman's happiness, and must do so to all time. He was not afraid of educational pressure, but it must be pressure applied and guided by knowledge. They did not fear the engineer raising his pressure to 120 pounds per square inch when his boiler had been tested to over 200. Till they were a little nearer the millennium they would not get their boys or their girls either educated even up to their safe capacity without applying some pressure. They must remember that part of the educative process was to increase inhibitionthe controlling power in all directions; and to do this they must teach their boys and girls to do disagreeable things because they are their duty. One of the highest things in education is surely to strengthen self-control and to intensify the sense of duty. But they could do that without hurting the health or taking all the sweetness and light out of life.

Dr Berry Hart said the great problem in education at present was how to give the utmost amount of education without doing harm,—the maximum amount of education and the minimum of harm. The error committed in many schools was that there was too much of the mental education, and far too little attention paid to the physical training of the children. That had become much worse in Edinburgh of late. The amount of time devoted to play was ridiculously small. In some large schools half an hour was allowed, and in some girls' schools there was no physical training at all to from six to eight hours study. As a result of over-education he had noticed anæmia and hysteria occurring among girls as well as chorea. That to certain of the girls was the most serious thing of all, as it might develop into something exceedingly bad in after life.

Dr W. W. Ireland said that Dr Strachan's views on education seemed to have been written for an ideal society. As the world was at present constituted, it was impossible to teach children only what was pleasant to them, or even what was best for the cultivation of their minds. Take one case, the English language was spelt in a most absurd and antiphonetic manner, which made it very difficult to learn. He did not think it wonderful that children should object to learn it, but learn it they must. A bad speller could never get on at any examination, and those who did not learn spelling when young never seemed to learn it during the rest of their lives. He did not think society was conducted on the best possible principles, but as it stood it was impossible to make the maintenance of the highest growth in the child the prime and only object, any more than to make the highest health in the adult their exclusive aim. When health was in danger of being lost they were called in as counsellors, when it was their duty to save health and life. The fact is, the children of the country were all engaged in a race of competition. It was all

very well to say that those who were in the front were running too fast—very likely they were, but those who fell behind were in much danger of losing rank which they could never regain. He did not believe that boys were fit judges of what they ought to learn, or that their natural inclination and tastes would lead them to learn what would be most useful to them when they grew up. He did not even think that the physical education of boys could be left entirely to themselves. Active and stirring boys might get on without enforced gymnastic training, but it was a great advantage to dull and sluggish boys. He believed that during the last twenty years much greater attention had been paid to physical training. He did not think in ordinary education we could dispense with the stimulus given by the fear of punishment and disgrace and the hope of reward.

Dr Ferguson (Edin. Institution) returned thanks to the Society, thanks in which he said all teachers would join, for the opportunity of hearing the paper and discussion. Teachers might be inclined to accentuate the spiritual aspect of their pupils more than their physical requirements, and a discussion such as they had listened to, by experts in the physiological aspect of education, could not fail to do good. The question of over-work was one which concerned the whole community as well as teachers. Certain attainments were required by the Civil Service Commissioners, professors in universities, and by all who directed or tested education, and these teachers were called on to impart. If pressure was needed to attain such, the taskmasters as well as the workers must review the whole. Teachers found they had enough to do to carry out the programme handed to them, and only the teacher who instinctively understood his pupils physiologically as well as mentally could hope for success. The love of knowledge was, as Dr Strachan had said, natural to a child, but concentration and discipline, the characteristics of civilized man, were not, and these formed the special work of teaching. In his (Dr Ferguson's) experience in a secondary boys' school the evil effects of over-work had not been much felt. In fact the boys that did most, and who should show the evils of pressure if it existed, were generally the healthiest.

Mr R. J. Machenzie (Edin. Acad.) said that in his opinion the day schools did not take sufficient account of physical education. When the school-room door was shut, most day-school masters considered that their responsibility for the boys was over. Yet many parents did not value physical education, and those who did were often unable to make proper provision for it. This should be the work of the school. He was not prepared with any cut and dried plan, but unless the day school made proper provision for physical education, in many cases such provision would not be made.

Mr Starkey (Collegiate School) said he had been struck by the advantages of the English public schools over the Scottish day-

schools in the matter of physical education. With a re-arrangement of hours something might be done towards the physical development of the pupils, but without the help of the parents he was afraid it would be little. The doctors, however, who had the ear of the parents, might help them very much in the matter.

Mr J. R. M'Laren (Great King Street) said the great difficulty which teachers had at the present time was, that owing to the amount of work entailed upon them by the examinations for which they had to prepare their pupils, no time was left for the development of the faculties and powers of the pupils.

Dr Rogerson (Merchiston Castle) asked the medical men to support the teachers in the matter of the physical development of their pupils by encouraging parents to allow their children to take part in school games. He did not mean a certain amount of exercise simply, but social games, for he thought the social friction of school games had advantages which a mere training in athletics-though he did not undervalue that-did not possess. He regarded the advancement which had been made in the direction of making education take in the whole sweep of a boy's powers, both bodily and mental, as enormous, and this he considered was one of the great secrets of the success of education at the present day. He expressed satisfaction at the change which it was proposed to make in the manner of allocating educational grants, holding that the one great drawback in the present system of education at the Board schools was that boys were simply pressed forward as rapidly as possible with the view of getting them through the Standards and securing the money grants.

Professor Chiene highly approved of physical exercise, and pointed out that it was of importance that schoolmasters in asking parents to allow their sons to play football should see that their scholars play only against those of their own size. Accidents occurred to those who were opposed to people stronger and heavier. Examinations and their stringency depended simply on the large number of those desirous to enter the professions. Any cause which lowered the number of applicants would at once lessen the examinationpressure.

Dr James Carmichael, in making some observations from the point of view of a medical practitioner, said he cordially agreed with the remarks of Dr Clouston in his special reference to the all-important subject of the education of girls, and it was to this he wished particularly to allude. On the general question he presumed they were met together as scientific men and educationalists to arrive at the truth, and to conclude as to the practical bearings of the present system of education on the health of their children, specially as regards the question of over-pressure. For any evils in the present system he thought the teachers were less to blame—if, indeed, they could justly be held responsible—than the general public. The teachers were merely the vendors, so to speak, of the articles which parents demanded. He thought in recent years there had been a great improvement in boys' schools, particularly in regard to the physical education and prolongation of play hours. The general tendency in this direction he thought highly commendable. As a result of his experience in practice, he had rarely found that over-pressure applied to boys. It was in girls that the evil effects of the present system of education were manifest. The tendency in the present day, he might say the fashion, was to educate girls on the same lines as boys. They were taught the same subjects in order to fit them to appear on the same platform as men, and compete with them in every walk of life. In his opinion this system was attended with the most disastrous results as regards the health of women. A large proportion of girls suffered, as medical men knew, when at school; but unfortunately, perhaps in the majority of cases, the evil effect of this system of over-pressure did not manifest itself immediately, but only became evident in later years, when as women they were called upon to discharge maternal duties. They had the strain of childbearing and rearing of infants to bear, and were they found equal to the occasion? He feared the answer of the profession must be in the negative. In girls who were so highly educated and over-strained as to their intellectual functions, the bodily health suffered in a large proportion of cases. The children born might be, and often were, delicate, and comparatively few of the mothers were able to suckle their babies through the whole of the natural period of lactation. The effect of this was decidedly unfavourable to the health of the infant, and a very serious evil to the community. How was the evil to be met? By an intelligent appreciation on the part of the parents and teachers of the physiological limit of endurance of mental work in girls, beyond which it was dangerous to go without endangering their physical health. He quite agreed with the remark of several of the teachers that it was only by co-operation with the medical profession on the part of parents and teachers that successful results could be attained. Medical men were justly proud of their relations as confidants and advisers in the family on many matters besides the actual treatment of disease. Let the parents take their medical advisers into their confidence regarding the education of their children, particularly their girls. Let the doctor be, as he ought, the health officer of the family, not only treating the ailments of various members as occasion might arise, but advising them in all matters concerning the education of their children in health.

Dr P. A. Young cordially agreed with the views expressed by Mr Mackenzie and Dr Rogerson as to carrying on the physical and mental education of children side by side. And after all that was

the method advocated in ancient Greece, where it perhaps reached its highest development. In modern days the nation which was perhaps the most cultured in Europe-Germany-had shown no deterioration physically, if they might judge by their prowess on the field of battle. He was at one with Mr Mackenzie in thinking that in boarding-schools the combining physical with mental training could be best attended to; but he thought in day-schools they might adopt, to a certain extent, the methods employed in boarding-schools. This end might be so far attained by adapting the hours of instruction to the season of the year. Thus in winter, by beginning school at 8 o'clock in the morning, the children could be dismissed at say 1 o'clock, when after dinner they might have time for exercise during daylight. In summer, by playing for an hour in the morning, being in school during the heat of the day, and playing in the evening. He had found in his experience that children broke down because they ate a hasty and often insufficient breakfast, hurry off to school, and when hungry in the middle of the day having an indigestible lunch, they came home tired in the afternoon, unable to eat dinner; and if they did eat it, were unable to digest it. The remedy for this was to have dinner in the middle of the day, as had been done in the Edinburgh Academy. By attending to such points as he had mentioned, he thought they might best secure "the sound mind in the sound body."

Dr J. M. Cotterill said that while Dr Strachan's proposition had been very severely criticised, he could not help thinking that there was a germ of truth in it, namely, that the individual capacity of each child for particular lines of study should be carefully noted, and that he should not be unduly pressed into channels of work which were manifestly contrary to the bent of his mind. With regard to what had been said about the necessity of football and other games, Dr Cotterill deprecated the easy way in which some medical practitioners were apt to give countenance to requests made on insufficient grounds that boys should be prevented from taking part in violent exercise.

The President, before calling on Dr Strachan for his reply, offered the thanks of the Society to the eminent teachers who had enlivened the meeting with their presence, and especially to Dr Ferguson and others who had enlightened it with their observations. As the hour was late, he would do no more than to enforce the necessity insisted on by Dr P. A. Young of making due provision at all their day-schools for proper feeding of the children about mid-day. It was of the utmost importance that they should not be allowed to go on working from 8 to 3 o'clock without having a good square meal some time between these hours. As regards physical training in connexion with their public day-schools, he believed great advantage would accrue to the children if they were made to pass through a regular daily drill in a well-ventilated gymnasium after

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their class-work for the day was over. In Amherst College, Massachusetts, all the students were obliged to attend such a drill in a gymnasium gifted some years ago to the institution by an old alumnus. The effect on the health of the students had been very remarkable. They had statistics to show that whereas formerly the morbidity and mortality increased with each successive year during the four years of study, the health conditions had been completely reversed since the gymnasium was opened, the sickness and the death-rate diminished in each successive session, and the fourth year's men were now found to be more vigorous than the freshmen who had just come up to college. There could not well be any subject more worthy of discussion than the successful upbringing of our children. The young of a nation were its most valuable possession, worth more than all its bank reserves, its ironclads, and armed regiments.

Dr Strachan thought it was unnecessary for him to take up the time of the meeting with any lengthened reply, as the discussion had drifted away from the subject of his paper, and gone into details which it was impossible for him to take up. Dr Ireland questioned whether the subject was a proper one for this Society, which, he said, had to do with pathology rather than physiology; but the medical profession had never confined itself to dealing merely with morbid conditions. The removal of the causes of illness-as in sanitary matters-had long been an object with their profession, and he thought might well be so with this Society. It was with this view that he had ventured to bring this subject before them. It was of little use their pointing out this evil, and that as being caused by school-work, unless they could at the same time indicate on what principles they could be guarded against. His object had been to lay down the principles upon which education should be conducted, and by which they might be able to judge when school procedure was tending to evil before the evil showed itself. Reference had been made to the connexion between what was called higher education and injury to certain functions; but he denied that this could ever be the case with true education, which was a perfectly natural process, consistent with the full development of all the functions. He held that so long as education was conducted upon right lines, health could never suffer in consequence of it. Great evils in connexion with school-work were fully acknowledged, and it was quite time for the medical profession to come to the front with some sort of guidance as to how they might be avoided.

Meeting VII.-March 5, 1890.

Professor A. R. SIMPSON, President, in the Chair.

DISCUSSION ON INFLUENZA.

Dr David J. Brakenridge-

MR PRESIDENT AND GENTLEMEN,—It has been felt that it would be well not to allow the present epidemic of so-called influenza to pass over without some attempt—not merely to produce one or two papers on the subject, but, as far as possible, to gather up the experience of the profession in Edinburgh regarding it, and to arrive at some definite conclusions as to the clinical features, etiology, pathology, and treatment of the disease.

The following remarks are unfortunately not, as I had hoped they would be when I promised to read this paper, based upon carefully taken records of cases observed in the Royal Infirmary; for it is a remarkable fact that, during the whole progress of the epidemic, not one single typical case of the prevailing disease has been admitted into my wards. Certain severe cases of lung disease there certainly have been, which may have originally developed out of some such influence; but these were of little or no value in connexion with a study of the so-called influenza.

This dearth of illustrative cases in the wards of the Royal Infirmary cannot be accounted for by the fact that a special hospital was provided by the town for the reception of such cases; for that hospital has remained until now without a single inmate a circumstance much to be regretted, as a scientific committee, appointed by the Council of the Royal College of Physicians, has been in readiness to take advantage of the first occupant and his successors, with a view to the settlement of some of the vexed questions connected with the disease.

I am obliged, therefore, to avail myself of the hasty notes which I have been able to take of cases which came under observation at a time when I was overworked on account of the epidemic.

As I have seen in one way or other 236 cases, the facts I have noted may have some value. At any rate I offer them for what they are worth, and as a basis for discussion.

The prevalence and severity of the disease among the rich and well-to-do, and the comparative immunity enjoyed by the poor and ill-conditioned, are points to which I will revert further on.

For the foregoing reasons I cannot give statistical tables which would be of any scientific value. The excellent report of Drs Elkin and Robertson of the outbreak of the disease at Morningside Asylum fortunately supplies such, and it is to be hoped that it will be complemented by similar reports from some of the other large public institutions. The following remarks are based upon notes taken of the more important facts observed in my own practice alone, and embody the conclusions I have arrived at from the observation of a large number of cases.

During the last weeks of October 1889 I met with a few cases of disease which puzzled me: feverish attacks of short duration, accompanied by headache, loss of appetite, and weakness. In some of these catarrhal symptoms were present, in others they were entirely absent, and I could find no explanation of the symptoms.

In the first week of November I had fifteen such cases under treatment, and I became convinced that I was dealing with a new and distinct form of fever, which I had not met with or read of before. This belief I expressed to many at the time, including several medical men. One of the very first typical cases occurred in the house of a medical man. The patient, a little boy, aged 4, became ill on the 29th day of October. His symptoms were somewhat sudden in their onset. They consisted of considerable fever, which lasted for one day, severe headache, pain in swallowing with only slight redness of the fauces to account for it, pains in the back and limbs, complete loss of appetite, and great prostration, which lasted for a considerable time afterwards, and was quite out of proportion to the degree and duration of the fever. At this time no reports had reached this country of the epidemic in Russia and other places.

Of the first fifteen cases that occurred during the first week of November eleven were children and four adults. Among the children there was a decided tendency to a peculiar form of catarrhal pneumonia, which was not met with among my cases later in the epidemic, unless in a few instances as the result of exposure to cold. To this pneumonia I will return further on. The prevalence of this complication among the earlier cases I attribute to the fact that, at that time, the peculiar sensitiveness to chills from the slightest exposure, which was afterwards seen to be a marked feature of the disease, was not recognised, and that extreme care to avoid the slightest exposure to risk, which characterized the treatment in the later periods of the disease, was not enforced.

During the whole of November and December I had a succession of such cases; they did not begin to become markedly more numerous until the fourth week of December, and they reached their maximum about the last fortnight of January 1890, when I had at one time over fifty cases under treatment.

The clinical features of the disease have varied very much in the details in different cases, but there has been a striking similarity in the main features in the great majority.

Usually the disease commenced somewhat abruptly, in some cases quite suddenly, in others more gradually. The first symptoms in most cases were severe frontal headache, pain in the eyeballs, in the back, and in the legs, and, very early, a feeling of giddiness and incapacity to fix the attention, but no great depression of spirits. These symptoms were usually associated with a feeling of malaise and slight shivering, rarely any severe rigors.

The temperature rose quickly, so that, within an hour or two after the onset of the attack, it was about 100°, and, in some cases—especially in young subjects—it rose as high as 103° or 104°.

During the first night the patient was restless, sometimes slightly delirious, sometimes he talked in his sleep, or merely had a busy night, with light and not unpleasant dreams. Next morning there was no appetite for breakfast, and for the first few days little desire for any except the lightest kinds of food, such as milk, chicken soup, fish, game, or such like in small quantities. This anorexia was always most marked in the mornings.

On the second or third day—more rarely from the first—the patients complained of *great soreness and tenderness over many parts* of the body, the feeling being exactly as if these parts had been severely beaten with a heavy mallet. When the thorax was the seat of this bruised sensation, the movements of respiration became very painful, and the pain closely resembled that of pleurisy. In no simple case uncomplicated with pneumonia were any signs of pleurisy discovered.

In many cases a peculiar pain was complained of, which, starting from the upper lumbar region, passed forwards in the abdomen, as it were, through the liver towards the stomach. In some cases it was among the earliest symptoms, in a larger number it commenced on the second, third, or fourth day. It varied greatly in intensity. When a prominent symptom, it was a dull, aching, sickening, often unbearable pain—a veritable angina. It fortunately seldom lasted longer than a few hours—rarely for a whole day.

The temperature in almost all eases fell to the normal within the first or second day.

Very soon—even in cases of moderate severity—the pulse showed signs of weakness and unsteadiness. It was moderately quickened; but what struck me most was a tendency in many cases for the radial pulsations, on slight exertion, and even in some without exertion, to become unequal in force and rhythm. So marked was this tendency in certain severe cases, that it was necessary to prevent the patient even sitting up in bed. In a few cases neglect of this precaution led to alarming syncope.

This weakness and instability of the pulse passed off in many cases very quickly on the cessation of the general symptoms of the disease, especially in those cases in which convalescence was rapid. In many patients the pulse remained weak, and easily quickened, for several weeks after convalescence commenced.

The urine was usually for the first few days very high coloured and

scanty, rarely it contained a small but appreciable quantity of albumen.

In no case were the conditions of the urine or the symptoms such as to suggest the existence of a true nephritis.

In two cases, in which the attack was sharp from the first, *I* had the patients weighed, and found that they had lost 10 lbs. and 7 lbs. in 5 and 3 days respectively. I had no opportunity of weighing my other patients, but it was clear in many other cases that a similar falling off had taken place.

There was noticeable in nearly all my cases, except the mildest, a very great tendency to fluctuations in the patient's subjective feelings; for some hours he would describe himself as feeling quite well, and then very quickly, almost suddenly, he would become restless, and complain that he felt uncomfortable, depressed, and ill. In some instances these unpleasant sensations were associated with feelings of feverishness or cold perspirations. For these alternating sensations no cause could in most cases be discovered.

In a few cases, during each recurrence of these feelings of malaise, there was a rise of temperature, sometimes very slight, at other times considerable, on one occasion to 102.4° .

During the whole illness the sensitiveness to draughts or changes of temperature was extreme. Even when the patient was surrounded with curtains or protected by screens, the leaving of a door ajar in the room almost immediately caused an attack of sneezing or coughing, which ceased when the door was shut. For this reason the symptoms were often temporarily aggravated, or a relapse caused, by going for a short period into a quite adjacent wellwarmed room, even when the greatest care was taken to avoid exposure to difference of temperature.

A few of my patients complained very early in the attack of slight sore throat, others of considerable pain and tenderness in swallowing. Examination of the throat in these cases revealed either triffing redness or gave a negative result. There was no marked running at the nose in any of my cases.

In most cases, usually between the third and fifth day of the disease, a peculiar and characteristic cough developed. This was dry, paroxysmal, and accompanied with little or no expectoration. During the intervals between the fits of coughing there was no feeling of discomfort in the air passages. The cough came on suddenly, very much as it does in a paroxysm of whooping-cough, and often, as in the latter disease, it ended in retching and the expectoration of a little tenacious mucus. The slightest draught in the room often, as I have already said, brought on a fit of coughing. This paroxysmal cough persisted in many cases long after convalescence had been established.

There was a marked tendency to disturbances of the alimentary canal. Throughout the disease the stomach and bowels were in a weak, highly sensitive, and irritable condition. There was loss of *appetite and a tendency to constipation*, and, so long as the diet was light, small in quantity, and easily digested, *nothing more*.

But if any but the most digestible food was taken, severe abdominal pain, retching, vomiting, or diarrhæa — sometimes all of these resulted. Eating oranges or grapes in many instances produced such results; and, in others, the same effects followed the administration of some very simple purgative, such as caseara sagrada or Gregory's powder. The state seemed to be one of atony and irritability.

Certain cruptions appeared in a considerable number of cases during the course of the disease; but none of these can be regarded as specially distinctive of it.

They occurred at various indefinite periods both during and after the disease. The eruptions resembled a number of well-known affections of the skin. The most common was a papular rash in some cases very like that of measles, in others resembling an erythema papulata; in many the characters were those of urticaria. Mixed forms of eruption were noted in a good many. As a rule, the eruptions were accompanied with itching and occasionally pain; in some they were followed by slight desquamation. The urticaria most frequently occurred on the face; the measley rash on the face, body, and extremities; the erythema papulata on the extensor surfaces of the forearm and hands, legs and feet—occasionally on the palms of the hands and soles of the feet—and sometimes on the abdomen alone.

Various forms of herpes tended to occur. These were most frequently seen in the neighbourhood of the lips and nares: in one case herpes zoster in the upper dorsal region, including the right arm, was met with.

Congestion of the conjunctive was present in a good many cases, and in one or two this ended in slight suppuration.

There was a marked tendency during and for a long time after the attacks to various forms of neuralgia, and in many cases to pain and occasionally some swelling in and below the knees and other joints, as well as hypercesthesia and hyperalgesia in various parts of the body.

Before passing from the typical clinical picture of the disease, I wish to direct very particular attention to the following fact, which I have thought it better to keep distinct from the foregoing, as I am not quite satisfied as to its exact meaning and place.

In many cases—including nearly all of those which I have watched closely from the first—the initial fever and accompanying severe symptoms diminished, or even apparently passed off, in from 12 to 48 hours, and on the second or third day of the discase the patients felt comparatively well, and many returned to their usual duties. Some had no further return of the symptoms. In most of these cuses, however, on the third or fourth day from the commencement, there was a somewhat abrupt return of the same symptoms as at first, usually in greater severity.

This initial fever, and period of remission or intermission of the symptoms, was so slight in a large number of cases that it might have been overlooked altogether, had not careful inquiry been made into the patient's symptoms antecedent to the main attack. In many cases I could elicit no evidence of this first short fever at all.

In my own case, and the only other that has occurred in my house, this first fever and remission were well marked. I suffered from severe headache, shivering, pains in the limbs, and a slightly elevated temperature on the evening of 23rd December; but was sufficiently well to attend to my work on the afternoon of the 24th December, and perfectly well on Christmas day. On the afternoon of the following day, at 3.15 P.M., I was suddenly seized with severe frontal headache and all the rest of the typical symptoms. My illness lasted over a fortnight.

Is this initial fever, intermission, and recurrence of the symptoms on the third or fourth day—which has happened in a large number of cases, and which has certainly been noticed by others—to be regarded as an accidental relapse, or as a feature in the typical clinical picture of the disease ?

So often did such a relapse take place on the fourth day, that I am disposed to think that the initial fever, the intermission, and relapse formed part of the course of the disease in the most typical cases.

The duration of the disease has varied greatly.

The shortest attack I have met with was a second one in a gentleman who had previously had the disease, and a relapse from which he had recovered quickly. A fortnight after his recovery, one evening, about 9 P.M., he was seized, almost suddenly, with severe headache, shivering, pain in the back and limbs, and a feeling of giddiness and general malaise. The temperature an hour later was 102.4° . He spent a very restless night, was alternately hot and dry, or bathed in a cold, clammy sweat. After very profuse perspiration he fell asleep at 6 A.M., and woke up two hours later, feeling tired, but otherwise quite well. He was able to perform his usual duties on that day and afterwards without any bad effects.

The most protracted cases were of very indefinite duration, the peculiar weakness, faintness, pains, and other symptoms lasting for two or three weeks, and then tapering off into convalescence so gradually as to make it quite impossible to say when the disease ended and recovery commenced.

It was therefore difficult in most cases to say when convalescence really commenced in this disease, because it was impossible in many to tell when the disease had terminated. Certainly the fall of the temperature to the normal could not be taken as a guide, for in some cases the temperature never rose above the normal. Taking the termination of the more distinctive symptoms as a clue to the beginning of convalescence, it has varied greatly in duration. *In some cases it has been complete in one or two days.* Of this my own case was an instance. On the 14th day of my illness I made an attempt to dress and go out for a drive. This resulted in an attack of syncope, followed by vomiting, which compelled me to return to bed. Next day I started on my round of visits, and worked out of doors for eight hours. Ever since I have felt perfectly well with this exception, that for ten days I suffered from daily attacks of facial neuralgia.

The more strictly patients were confined to bed the more speedy and perfect was the recovery.

Quite the reverse was true of many cases in which the attack was slight, and very little care was taken.

In these, although there was no true relapse, convalescence was often protracted, and recovery very imperfect—indeed, some who had their attack about Christmas time are at the present moment even weaker and less able for their duties than during the attack.

The condition of many of these is very striking. They have lost flesh, suffer from cerebral pains, giddiness, and weakness. They look feeble and dazed; fainting attacks are not uncommon. They suffer from pains in various parts of the body; in some cases, for example, over a somewhat undefined area corresponding with the lower half of the precordia, and the hypochondriac and epigastric regions; in others in the lower extremities. Food brings on pain and even sickness; a mild purgative—such as cascara sagrada or rhubarb—produces violent vomiting and diarrhœa; a little alcohol causes intoxication, and so forth. It is impossible to say how long it may be in some of these cases before health will be completely restored.

The following exceptional facts may be noted here :--

1. In three cases the first symptom of the attack was a sudden faint—on recovery from which the ordinary initial phenomena of the disease rapidly developed.

2. In one case profuse haemorrhage from the stomach was among the earliest of the symptoms. The patient was a young lady from Geneva, aged 25, residing in Edinburgh for the winter. She was of large build and well developed, previously somewhat chlorotic, but otherwise in good health. On 29th November (1889) she complained of pain in the head, back, and limbs, and severe pain in the abdomen. Almost simultaneously with the commencement of these symptoms she vomited a very large quantity of blood, and her temperature ran up to 104.6.° On inquiry I found that it was about the period when menstruation might be expected, and this did become established two days later, and was unusually severe. She had never previously vomited blood. Her attack of the disease—so-called influenza—was unusually severe, and her life was in great danger for a week from the combined effects of this and the great loss of blood.

3. The tendency of the disease to attack women about the menstrual period was in many other cases a very noticeable fact.

4. In two cases *paralysis of the bladder* occurred, lasting in one 48, in the other 36 hours.

5. There was *slight wrist drop* in one case.

6. In a boy of 14—at present suffering from the disease—herpes zoster has developed. It is situated in the upper segment of the thorax on the right side, and involves the arm and axilla.

[7. In one case, which I have seen since my paper was read, there was aphasia and word blindness.]

The great majority of my cases have presented no marked deviations from the foregoing picture.

In a considerable number of cases, as I have said, there has been that quasi-relapse after a short initial fever and intermission, which I am disposed to regard as a feature of the most typical form of the disease and not as a relapse.

No true relapse has occurred in any case where the patient was guarded against exposure to cold, and indiscretions in diet, until the distinctive symptoms had quite ceased.

Severe relapses followed—in one or two instances—very slight carclessness, even where the disease was originally very mild.

The following case is interesting as an illustration of this, and instructive in other respects :- A young gentleman, aged 20, was attended for me during my illness by Dr Alexander Bruce for what was originally a very slight attack. Twelve days after the commencement of this attack, when convalescence appeared to have set in, contrary to my orders he went along the lobby into another room to see his sister, who was also ill. An hour or two later he was seized with shivering, very soon his temperature rose to 105.2°, and severe vomiting and diarrhœa came on. The diarrheea was easily controlled, but painful retching like that of sea sickness with complete anorexia continued for two or three days. He further suffered from bleeding at the nose, and as the sickness passed off he began to expectorate a small quantity of mucopurulent sputum mixed with blood. On careful examination a small area was discovered, just below the angle of the scapula on the left side, in which the physical signs were, diminished vocal fremitus, slight dulness on percussion, feeble breath sounds-not bronchial, and numerous tolerably fine crepitations at the end of inspiration and beginning of expiration. In three days after they were detected, these signs-which pointed to local congestion and catarrh-had completely disappeared. Just when the severe vomiting had been checked, his bladder became paralysed, and he suffered from complete retention of urine for 48 hours.

Mr A. G. Miller, who drew off his urine on one occasion, noticed

and remarked to me that the bladder gave little or no assistance; that it seemed not to contract at all. At this time he was able to stand up at the side of the bed, and repeatedly made unsuccessful efforts to micturate. Under the use of sweet spirits of nitre with small doses of liquor strychniæ he gradually recovered the lost power.

I may mention here that a similar paralysis of the bladder occurred in another case. The patient was a gentleman 35 years of age, and his case presented this peculiarity, that for ten days the temperature tended to rise occasionally at irregular intervals to from 100° to 101°. On the eighth and ninth days of the disease he had retention of urine for about 36 hours.

A peculiar form of congestion of the lungs often ending in bronchitis and catarrhal pneumonia, and which followed a peculiar course, was frequent among the earliest cases which I met with, and chiefly in children. I will refer to this again.

I have met with three cases in which there was a distinct second attack after an interval of comparatively good health, and one case in which there were probably three attacks, the third being very slight and transient, but characterized by the headache and pain in the back and limbs.

The disease has appeared to me to attack both sexes with equal frequency and severity.

It has occurred at all ages,—my youngest patient was 3 years of age and the oldest 75.

In the first period of the epidemic, children appeared to have been attacked in greater numbers than adults. From 14th December to 27th January, in my experience, the larger number of the patients were adults.

The rich and well-to-do would appear to have suffered more than the poor and ill-conditioned. I can draw this conclusion only from my own experience of its prevalence in private practice, and almost entire absence in the wards of the Infirmary; but the physicians in charge of the large poor-houses will be able to assist in the determination of this interesting point.

None of my cases have proved fatal.

This so-called influenza appears to me to be a disease—whatever the exact nature of its cause may be—which is characterized by profound disturbance of the nervous system. Upon this view all of the symptoms and complications can be explained. All observers are agreed that in this disease the symptoms referable to the nervous system bulk most largely. A careful study of all my cases has satisfied me that in those, even the most severe, in which from the outset the exciting causes of complications were excluded, the essential symptoms were entirely confined to those which could be referred to the nervous system. There can thus be no question as to the nature of the following symptoms:—

a. Headache, pains in limbs and body, hyperæsthesia, paralysis of the bladder, and paresis of the forearm.

b. Giddiness and tendency to faint, and early weakness.

c. Weakness, irregularity, and tendency to intermission of the heart's action.

d. Nausea, retching, and vomiting as an initial symptom.

e. Careful study of the sore throat showed it to be really due rather to hyperæsthesia than to inflammation, for in nearly all the cases in which it was present examination showed that there was either nothing visible to account for it, or merely slight redness. It was clearly due to mucous membrane or neuro-muscular hyperæsthesia and hyperalgesia. Undoubtedly hyperæsthesia tends to become associated with congestion.

f. A similar explanation accounts most satisfactorily for the stomach and bowel disturbances. The vomiting was nervous vomiting, in some cases occurring simultaneously with severe cerebral disturbances, in other cases resembling the violent, futile efforts of sea-sickness, with even more pain. In the great majority of cases the tongue remained quite clean, or was very slightly furred. The diarrhœa was similar: it was severe, associated with very painful colic, and unaccompanied with any signs in the stools of inflammation of the bowel. It is well known that paralysis and spasm are closely allied effects of functional disturbances of the nervous system. The condition of the stomach and bowels illustrated this. When bland food alone was given, there was only loss of appetite and constipation; but the slightest deviation in the direction of indigestible food, or slightly irritant purgatives, brought on severe pain, with retching, vomiting, and diarrhœa.

g. The cough present in this disease was essentially purely nervous. It was paroxysmal, closely resembling that of pertussis; no uncomfortable sensations were felt in the intervals; but the slightest cold draught tended to bring it on. This pointed to exaggerated reflex irritability and abnormal sensitiveness of the laryngeal mucous membrane. In one case slight laryngitis occurred.

h. The eruptions were all of the class of neuroses; for example, urticaria, herpes zoster, nasal and labial herpes, and erythema, all indicate such a common starting-point as the nervous system.

i. Vaso-motor and secretory disturbances, such as flushings, sweatings, and hæmorrhages from the nose and stomach, were frequently met with.

It seems to me that the peculiar forms of congestion and inflammation of the lungs met with as an accidental complication in this disease are best accounted for on the view that they are the result of a state of functional irritability of the vaso-motor nerve centres. In many cases the behaviour of the pneumonia was very peculiar, and may be shortly described in this way :—It was characterized by localized congestion, which in some cases ended in catarrhal pneumonic inflammation. This pneumonia presented in some cases a peculiar tendency to shift from one position to another in the lung, or from one lung to the other, in a most remarkable manner.

I have met with several such cases, and the most characteristic occurred in young children. To illustrate this, I will give you a summary of a most interesting case, the patient being a little girl, who was under Dr A. L. Macleish's and my care early in November, and who was most carefully watched and observed by my friend Dr Macleish, from whose notes I quote, and for the accuracy of which I can fully vouch.

Summary of Dr Macleish's Notes of the Case.

November 11.—Commenced with headache and a rise of temperature to 101.6°, followed by symptoms like those of mild bronchitis on the 12th.

November 13.—Inflammation of lung tissue in upper lobe of left lung, with bronchitic signs in the rest of the lung.

November 14.—The inflammation in left apex slightly diminished; congestion of right lung behind in a limited area below the angle of the scapula. This cleared up in the course of the day; in the evening no marked dulness could be detected anywhere, but crepitations found in various parts of the upper lobe of the left lung.

November 15.—Marked signs of congestion of left lower lobe, with fine crepitations at the angle of the left scapula, and increased vocal fremitus and resonance. Later in the day, having been lying all day on the right side, there was found well-marked pneumonic crepitation all over the right lung, the left having greatly cleared up, save at the angle of the left scapula, under the left clavicle, and outside the left nipple. Still later, the crepitations were more equal on the two sides.

November 16.—The lower lobe of the right lung has cleared up, and the upper lobe become consolidated. Later in the day, only signs of bronchitis in the lower part of right lung.

November 17 and 18.—There are now four areas—viz., in left apex, patch outside left nipple, patch at angle of left scapula and in right upper lobe. Bronchitis more intense in right lung.

November 19.—An area of congested lung appears again below the angle of the right scapula in the position noted on the 14th.

November 20.—The last-noted area has quite cleared up.

November 21 and following days.—All the areas gradually clear up. Such a condition of the lungs is exactly what might be expected from an erratic and fluctuating intense vaso-motor disturbance of the organ.

In other cases the vaso-motor disturbance has been more per-

sistent, and has chiefly led to the signs of intense congestion of the lower lobes, with catarrhal expectoration, and little tendency to consolidation in most cases, although ending in consolidation in some. That vaso-motor congestion should in some instances pass over the boundary line, and terminate in local inflammation, is what one would expect.

On this theory all the deviations from the purely nervous type and the complications can, I think, be best explained.

The clinical features of this disease are identical with those of the epidemic which has been prevalent in Russia, Germany, etc.

It is unnecessary to argue this statement, as I believe every intelligent physician admits it, and I shall at any rate not consider it necessary to enter into any proof of it to-night.

It is a remarkable fact that the disease would appear to have commenced at St Petersburg during almost the same weeks as those in which the first cases were noted in Edinburgh. From various accounts which have recently been published, I find that, in St Petersburg, after a few sporadic cases in October, the disease developed rapidly during the first week of November 1889. This corresponds exactly with the period during which my first cases were noted here. Admitting that it may have broken out in other parts of Russia before this, it is a remarkable fact illustrating the great rapidity with which the disease producing influence became widely diffused—that the occurrence of the disease should have taken place in such distant countries, with intervening sea, almost simultaneously. It stands out in striking contrast to the fact, that quite adjacent towns or villages have been successively attacked after considerable intervals of time.

From these two strongly contrasted facts, the development of the disease would appear to depend on two distinct factors:----

1. A wide-spread influence-probably atmospheric.

2. Certain local conditions.

From the rapidity with which the disease influence manifested itself almost simultaneously in widely distant countries, we may infer that it is at least partly *due to some subtle atmospheric condition which becomes with great rapidity widely diffused.* This is not the mode of spreading of any other known disease depending on a micro-organism; if it is supposed to be conveyed by letters, or such like, it should be shown to be clearly contagious.

From the fact that intervals of many weeks have elapsed between the times at which quite adjacent towns have become affected, we must conclude that this wide-spread influence is not the sole condition on which the outbreak of the disease depends. Certain local conditions must exert an accelerating or a retarding influence on the activity of the virus.

The following facts lead one, however, to conclude that the

disease is a fever, and due to a cause similar to that of the other specific fevers :--

a. The sudden onset, etc.

b. The fever.

c. The typical course.

It is, therefore, probably due to a micro-organism.

The inference, then, which seems to me to meet the difficulties to which I have alluded is the following :---

The micro-organism which is the cause of the disease exists in all parts of the earth. It is, however, only under certain conditions that it becomes sufficiently active to cause severe symptoms in man and animals.

It becomes epidemic, or pandemic, when the influence which causes it to become thus active is wide-spread or universal. This wide-spread subtle condition—whatever it may be—although it pre-eminently brings into activity the micro-organism which is presumably the immediate cause of the prevailing disease would appear to have an influence in stimulating into virulent activity various other disease germs, such as those of measles, whooping-cough, pneumonia, scarlatina, and catarrh, which are not only unusually prevalent at present, but are unusually severe and fatal. In this way the large mortality from other diseases may be accounted for.

Very vague explanations or suggestions of what the changes in the state of atmosphere and the local conditions are have as yet been forthcoming. The mildness of the season has been universally noted as a coincident fact.

Regarding *the local causes*, the only fact that I have been able to note as an apparent causal factor may be stated as follows:—

The great majority of my cases occurred singly, *i.e.*, one in a family at a time; or, where more than one was attacked, the intervals between their attacks were considerable. In a few instances, however, it happened that almost all the inmates of the house took the disease in rapid succession. In the four worst cases of this kind from 7 to 9 inmates were ill at one time.

In two of these the corridors and rooms in the houses were warmed with hot air pipes on the American system. In the remaining two the rooms and lobbies were kept excessively warm with stores and large fires. It is possible that this excessive heat might—like the prevailing mild state of the atmosphere—either favour the development of the disease germs in certain houses, or, by weakening the inhabitants, predispose them to take the disease.

There are many facts which tend to support the view that the rich and well-to-do have suffered more than the poor and ill conditioned. I do not know whether or not the opposite condition from the above, the want of coal and consequent coldness of their homes, can in any degree be regarded as offering a possible explanation of the immunity in such cases.

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It would be interesting to know whether there is any difference in regard to the temperature maintained in them, between Institutions such as Morningside Asylum, where a large number of cases have occurred, and such, on the other hand, as St Cuthbert's Poorhouse, where — as Dr Aitchison informs me—few, if any, typical cases have been met with.

What is this disease? It differs essentially, in many important respects, from ordinary sporadic influenza, and in some respects from the type which has characterized previous epidemics of influenza. Is it really influenza?

Dr Frank Clemow—one of my former pupils, writing from St Petersburg—in a letter to the *British Medical Journal*, dated November 27th, 1889, says regarding the outbreak of the epidemic there :—"It is frequently spoken of in the lay papers as influenza, but the typical symptoms of this disease are far more frequently absent than present; and the only features in common are the rapid course, the extremely rapid spread, and the frontal headache —the great running at the nose and eyes being absent in all the cases that I have seen."

In very few of the cases I have attended have there been any of the catarrhal symptoms which are so characteristic of influenza. When these have occurred they were evidently accidental, and easily accounted for by the vaso-motor irritability which has been undoubtedly a characteristic feature of the prevailing epidemic.

It is remarkable that several military surgeons, who have had experience of both influenza and dengue, lean to the view that the disease is a form of dengue modified by conditions of place and climate. One of my patients, a General Officer who had long served in tropical climates, who commanded a division of the army in Burmah during the late war, and who had himself suffered from dengue, had no hesitation in asserting that his recent attack of so-called influenza was not influenza at all, but dengue. He founded this opinion on the entire absence of catarrhal symptoms, the presence of an eruption, and the persistence of pains in the neighbourhood of the knees and other joints.

The course of the disease in those cases which began with a short initial fever, a distinct remission, and a recurrence of the symptoms on the third or fourth day, certainly resembled that of dengue rather than of influenza, and the forms of eruption present in a considerable number of the cases in the present epidemic are identical with those which have been described as of frequent occurrence in dengue. But it is not easy to say positively that the disease is either dengue or influenza. Is it not possible that dengue and influenza are modifications of the same disease, and that this is an intermediate type ?

In an interesting account in the British Medical Journal, of

February 15th, of an obscure outbreak of dengue occurring on board H.M.S. "Agamemnon," while stationed at Zanzibar, between November 1888 and September 1889, by Charles C. Godding, staff-surgeon R.N., a modification of the dengue fever is described which, while undoubtedly dengue, in many respects resembled the present epidemic of influenza. It was believed to have been introduced into the ship by an officer who had been staying for a few days at Aden, where the disease is very common, and who was the first to suffer from it. 175 cases occurred on board. The ship returned to Malta, when the present epidemic was rife, at the end of last year. The interesting point is this, the erew of this ship —which had during the past year suffered severely from dengue—had at Malta, when the paper was written, suffered much less from the socalled influenza than any of the other ships. What is the explanation of this comparative immunity ?

Many other army and naval surgeons have noticed the great resemblance between the present epidemic and dengue. Surgeon E. J. Erskine of the Army Medical Staff, Gravesend, states in the same journal his conviction that "the present epidemic is only dengue modified by climate."

My own opinion is that much of the evidence is in favour of the disease being influenza, but that there are a sufficient number of the characteristic symptoms of dengue present in many of the cases to make it difficult to give a negative answer to the question, Are influenza and dengue not possibly modifications of the same disease? The following facts are all characteristic of dengue rather than of influenza :---

1. The absence of running at the nose and eyes.

2. The short initial fever, remission and relapse, and tendency to later relapses.

3. The severe, persistent pains in and near the joints—in some cases associated with swelling.

4. The various forms of eruption.

Dengue has been limited to tropical climates hitherto. If it is simply a tropical modification of influenza, may not the tendency of the present epidemic to assume something of the dengue type be due to the mildness of the season?

Is this disease contagious, or simply miasmatie?

It is impossible, I think, to give a very definite auswer to this question, but to my mind the evidence is in favour of its being either not contagious at all or very feebly so.

The following facts are against its being essentially contagious, in so far as my experience has gone :---

1st, The number of cases in which those occupying the same room and even bed with a patient have escaped.

2nd, The fact that in no case in my experience has a nurse while attending cases of influenza contracted the disease.

3rd, The large number of the cases which have occurred either as isolated examples, or successively at such intervals of time as to make contagion uncertain.

Of course, in the case of a disease which tends to affect so large a proportion of the community, it is certain that several members of a family will sometimes be attacked apart altogether from contagion.

Regarding the treatment of the disease, I have come to the conclusion that no drugs cut short the disease, and that the most that can be done is to guide the patient through it in such a manner as to steer clear of complications. I would recommend that the following rules should be followed :—

1st, In all cases, recollecting the great tendency to a recurrence of the disease on the third or fourth days, keep the patient in bed, or carefully guarded against cold until that period is over.

2nd, In all cases maintain the same precautions until all the symptoms of the disease have disappeared.

3rd, Give only the lightest and most digestible food during and for some time after the disease.

4th, For the constipation, avoid all irritant medicines, and keep the bowels open with saline purgatives, such as Carlsbad salts the powder form—Hunyadi Janos, etc.

5th, For the pains and feverish attacks, administer antipyrin in doses of from 5 grs. to 10 grs. as required.

6th, For the pareses and paralysis, administer strychnia in very small doses.

7th, Avoid alcohol in the form of whisky or brandy as you would avoid poison until the symptoms of the disease have quite ceased, when a light claret or champagne is useful.

8th, During convalescence, administer tonics according to the special requirements in each case.

Surgeon-Major Black remarked that he had taken note of the mortality column of the *Times* for three weeks in January, during the crisis of the epidemic of influenza, and found that an average of 57 deaths prevailed daily, and the maximum of 88 occurred on Jan. 14th, and 82 deaths occurred on Jan. 21st. These amounts may be presumed to have occurred to well-to-do people or their friends in or out of London particularly, and not to poor people, and where specified, seemed to consist mainly of diseases of the chest. He was of opinion that the cause of influenza was aerial and not pythogenic, as it occurred in the fine climate of the Cape and on board ship, and there was as little reason to attribute it to the prevalence of ozone, as the disease flows from Eastern Europe, whereas this agent is transported by westerly winds from the It would, therefore, be likely that those who had Atlantic. occasion to go out much into the open air would be more liable to attack than those under shelter and warmth, or even over-crowded.

Dr M'Bride thought that Dr Brakenridge ought before now to

have been thanked for his paper, probably the most masterly exposition which had yet appeared on the subject of influenza. Dr M'Bride was in the main able to confirm what Dr Brakenridge had said concerning throat affections. In the few cases of this kind which had come to his clinic, a comparatively trifling amount of pharyngitis was associated with great pain and marked constitutional symptoms, while the patients had what might be called a stricken appearance. Turning now to the ear, Dreyfuss and Schwabach had observed a marked tendency to middle-ear inflammation associated with hæmorrhages into the substance of the drum membrane. This, Dr M'Bride had not seen, although in several cases there had been a history of bleeding from the ear. The cases of middleear suppuration, however, he had met with were marked by this peculiarity-the pain did not cease on the appearance of the discharge, as is usually the case; on the contrary, it sometimes increased, while the mastoid process was often tender, and the cases often gave the idea of approaching head complications. Most of them, however, did well, but pain behind the mastoid over the anterior part of the occipital bone sometimes persisted, even after the ear was practically well. Michael has recently recorded similar observations during the epidemic of influenza in Hamburg. Dr M'Bride begged to ask Dr Brakenridge what was the condition of the spleen in influenza?

Dr Andrew Balfour said that in Portobello the influenza was not confined to the well-to-do classes. Very few cases occurred among the very poor, but the working classes were as severely attacked as the well-to-do classes. In the mining village of Newcraighall, 2 miles from Portobello, the epidemic was very prevalent, 146 cases occurring there in three weeks, all of them displaying the characteristic features so ably brought forward by Dr Brakenridge. None of those affected in that village could be said to be over-fed, nor did they live in over-heated houses. None of the cases suffered from corvza, and there were not more than six cases of relapse, two of which developed pneumonic symptoms. In two cases peculiar rigors occurred for two or three weeks after the epidemic, especially when the patients touched any cold substances. These symptoms yielded to quinine. The epidemic began in the last week of December, but the week before that there were a large number of cases of broncho-pneumonia among children.

Dr Buchan (Secretary, Scottish Meteorological Society) stated that Sir Arthur Mitchell and himself were engaged on an inquiry with reference to the recent epidemic of influenza in its relations to weather. In their inquiry they dealt with deaths registered as due to or caused by influenza in London between the years 1845–90, the London statistics having been chosen because there was there a vast population in a small area, all subject to the same climatic conditions, and because there was also there a weekly record of deaths and their causes for a long period. He pointed out certain errors to which such an inquiry was liable. chiefly arising from the methods of registration. At the same time, it would be found that the figures stated disclosed certain phenomena with such emphasis that, after giving a large discount for possible errors, the lessons taught by the phenomena stood altogether unaffected. For instance, it was found, taking the distribution of the number of deaths over the year in the forty-five years referred to, that there was a well-marked winter maximum and a well-marked summer minimum. There was also a small secondary maximum in the second half of March and the first half of April. This distribution of deaths from influenza in London corresponded with the mean distribution of temperature. When temperature was low the number of deaths was high, and vice versa. The distribution of deaths from influenza was also essentially the same. generally speaking, as that from diseases of the respiratory organs. If they examined the forty-five years in question, they would find that there were five periods in which the figures pointed to the existence of an epidemic of influenza-1847-48, 1850-51, 1855, 1857-58, and 1889-90. The mean yearly number of deaths over the whole period registered as due to influenza had been 104, and the total for the forty-five years 4690. The following were the exact periods of the epidemics and the number of deaths registered as due to influenza :- December 1847 to April 1848, 1631 ; March to May 1851, 258 ; January to March 1855, 130 ; November 1857 to January 1858, 123; and January to March 1890, 545. The five epidemics yielded 2687 of the 4690 deaths registered, or about 57 per There was no one year in which there were not some deaths cent. registered as due to influenza; but during, say, the last twelve years of the period the registered deaths had been decidedly fewer than during the thirty-three first years of the period with which they were dealing, and which embraced the whole period for which they had figures. In point of fact, the annual mean for the twelve low years referred to was 6.5. He then gave some of the details of each of the epidemics within the period under consideration, and also the character of the weather which prevailed during each of thempointing out, in passing, that in regard to all the rise to the maximum was exceeding rapid after the disease had been recognised as existing in the country. The general conclusion arrived at was, that epidemics of influenza in this country, though they occurred during the winter, were not connected with exceptionally cold weather, especially at their commencement, but rather with exceptionally warm weather, which manifested itself generally both before and during the epidemic. This was what was disclosed by an examination of the deaths registered in London as due to influenza during the forty-five years of which they were speaking. Speaking particularly of the recent epidemic, it was pointed out that the total mortality from all causes had been much over the average, and that this was not explained by the increased number

of deaths registered as due to influenza. During the first four weeks of the year, when the mortality from influenza was at the maximum, the total number of deaths was only 343, whereas from all diseases the number of deaths was 10,065, which was 2258 above the mean death-rate of these four weeks for the previous ten years. It, therefore, became a point of interest to ascertain what the diseases were which had been exceptionally high during that period. and, on the other hand, whether there were any diseases which had been less fatal than usual during the period. It appeared that the diseases which had yielded an exceptionally high general deathrate during the influenza epidemic were diseases of the respiratory organs, diseases of the circulatory system, rheumatism, and diseases of the nervous system, the chief of these being diseases of the respiratory organs. These diseases had produced an exceptionally large number of deaths, in spite of the fact that the temperature had been exceptionally high, and fogs absent, which was contrary to all past experience, and indicated that during the period something of an exceptional character had been operating to increase the deaths from diseases of the respiratory organs. The strong manifestation of nervous symptoms in the severe headaches and prostration which attended the attacks of influenza made the rise of deaths from diseases of the nervous system and of phthisis interesting, and might be related to the secondary spring maximum pointed out as appearing in the figures on the mean of the fortyfive years. So, also, the increased number of deaths from rheumatism might be interesting in connexion with the muscular pains which were so constant a symptom of influenza. Turning to the diseases which had yielded a lower mortality than the average during the prevalence of the epidemic, these were diarrhœa, dysentery, liver disease, measles, scarlet fever, typhoid fever, and erysipelas. It was necessary, however, to remember that the figures referred to London, and that in other places there might be epidemics of measles and scarlet fever. With regard to the weather, the first three weeks of November had a temperature above the mean for these weeks; the last week of November and the first two weeks of December had a temperature below the mean; the last two weeks of December had a temperature above the mean; the first week of January had a temperature above the mean; the last three weeks of January and the first week of February, when the epidemic was at its height, had a temperature much above the mean; and since that time to the middle of March the temperature was below the mean. As regards the question of age, while the excessive death-rate in London had been spread over all ages, the point of interest seemed to centre in the rise of the death-rate of all persons above the age of 20, during the four or five weeks which immediately preceded the epidemic, if the registration of deaths as due to it could be taken as disclosing the time of its appearance. Whether influenza did or did not prevail

in November or December, there appeared to have been something then present, apart from weather, which increased the deaths of all persons above the age of 20 much above the mean. In discussing the spread of the germs of diseases from one country to another by the intervention of winds, it had perhaps been universally assumed that it was only the winds blowing over or near the surface of the earth which were concerned in the distribution of the germs. If these surface winds did not account for the successive appearances of the epidemic in different countries, it was concluded that the germs had not been transported by the winds. This, however, was only a mode of looking at the subject which ignored the recent developments of meteorology, and its teachings regarding atmospheric circulation through cyclones and anti-cyclones. As was now virtually proved, the winds in a cyclone were drawn inwards towards its centre, and then ascended in a vast aerial column to the upper region of the current towards any cyclone or cyclones that might surround them. Thereafter they slowly descended down the centre of the anti-cyclone to the earth's surface, from which they were carried in every direction. Owing to the known rapidity of these aerial movements, two or at most three days were amply sufficient for this distribution. It was during the winter months that this rapid and complete distribution of atmospheric impurities from country to country in Europe was effected. In the summer months cyclones were rare, and but imperfectly developed, and, besides, the whole wind system of Europe was then more directly and immediately connected with the Atlantic Ocean on the one hand, and the interior of Asia on the other.

Dr Allan Jamieson observed that he hardly thought that the warmth of the houses explained the larger number of cases among the better classes which Dr Brakenridge said he had noticed. Exposure out of doors had, however, a decided determining effect. The nurses at the City Hospital suffered out of all proportion and severely, yet did not communicate it to the patients under their charge, who, indeed, in their turn escaped practically entirely. He had remarked that during convalescence and for some time subsequent to an attack patients complained of great thirst, more than after any febrile affection with which he was acquainted; this bore no relation either to the degree or duration of the antecedent pyrexia.

Dr Clouston said his experience was very strongly confirmatory of Dr Brakenridge's generalization, that this disease was one essentially affecting the nervous centres. They all knew that the higher nervous centres were affected very differently in different cases as the result of a heightened temperature. An ordinary catarrh of the mucous membranes, with a temperature of 102°, would in many persons scarcely cause any nervous symptoms at all, while in certain nervous children a temperature of 99° would always cause night delirium. His experience was that this was

the fever most destructive of nervous energy of any fever he ever saw for its intensity and duration. Especially was the mental energy paralyzed. The volition was exceedingly weakened in all cases; not a single patient could come to any resolution, could carry out any scheme-they all felt utterly prostrate. The emotional faculty was much depressed. The patients all had a sense of organic ill-being, not one being consciously happy, the reasoning power was so much interfered with that almost a delusional state was established, especially at nights. The sleep power was always interfered with. Many of his cases were delirious; bad dreams and wandering; insomnia very common indeed. It was a very extraordinary fact that their 200 sane and strong officials and servants at the Asylum were affected in the proportion of 30 per cent., while their 700 insane and more or less weak were only affected in 9 per cent. Both of these classes lived in nearly the same conditions in the house. But the sane were out in the fresh air much more than the insane, and went into town once or twice a week. One very marked feature was that the incidence of this disease bore no relationship to exposure to cold and chill. Many of their cases had been in bed in an equable temperature for many weeks before being attacked. His experience did not bear out Dr Brakenridge's theory of the relationship of the disease and warmth. Their thirty wards at Morningside were very different as regards the temperature at which they were kept, yet there was no perceptible difference in the proportion in which the patients were attacked in those wards.

Dr Littlejohn in the course of his remarks emphasized the following points :---1st, That as yet the poor population of the city had escaped the epidemic, and that more particularly no case had occurred in the common lodging-houses, which accommodated 1700 of the lowest class of the population. 2nd, That for some weeks there had been a marked rise in the week of mortality returns from diseases of the chest, which had for two weeks raised the general mortality of the city to the unprecedentedly high rate of 32 per 1000. The proverb that "a green Yule maks a fat kirkyard" had always been true as regards Edinburgh, and in the course of the last twenty years, on two occasions during mild winters the mortality had even exceeded that just mentioned. 3rd, That intercurrent with the influenza, measles was present in an epidemic form. 4th, That in the entire police force, numbering 500 individuals, and exposed night and day to a very free ventilation, fifty cases had been reported, with very few exceptions slight in character. Although the constables were either single, living in families, and in many cases sleeping with a fellow constable, or had families of their own, no evidence of direct contagion could be obtained. 5th, The deaths attributed to influenza (and in some of the cases rather dubiously) amounted to seven. 6th, Although wards, fully equipped and in constant readiness, were provided in the City

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Hospital by the authorities—the medical profession being duly aware of the fact—no application was made for the admission of any patient.

Dr Barrett said there were two points of importance in the morbid anatomy of some of the fatal cases at the Royal Edinburgh Asylum. In four cases pericarditis was found. In two of these there was slight pericarditis over right auricle. In one, over right auricle and right ventricle at the base. In one, general purulent pericarditis—and this was a case of long duration. In the lungs, dry pleurisy was common when not combined with pneumonia. The form of pneumonia common was broncho-pneumonia, and this had a special tendency to become purulent, and with a general congestion of lung, a marked friability. In all the cases there was alteration in the kidney, which microscopically consisted of an intense cloudy swelling, but with little or no change in the Malpighian bodies or in the vascular system.

Professor Chiene mentioned the importance of the preventive treatment in infective diseases. He pointed out that the author of the paper, by the use of sulpho-carbolates, had been one of the first in this country to advocate the administration of substances, which by altering the blood would render the organisms harmless, even although they gained entrance. He had with others made an experiment with corrosive sublimate, taking 24th of a grain thrice daily for three weeks, in order to see if this drug would have any effect in warding off the influenza. Thirty letters had been received from those who had taken the drug. In four, they had taken it for too short a time, so that twenty-six gave it a fair trial. Two of these had influenza complicated with bronchitis; five had feverish colds which might be called influenza; the rest escaped. The numbers were too small to be of any value, and they were brought before the Society, not as useful in themselves, but as an indication of what Prof. Chiene believed to be a most important method of treatment, both in regard to medical and surgical cases.

Dr Caverhill referred to the first cases as occurring amongst "neurotics"—people usually the most susceptible to contagious disorders. Their temperatures were usually 1 or $1\frac{1}{2}$ degrees below normal. About and after 1st January digestive disturbances were most marked, while later on respiratory complications were seen. He had seen several cases of congestive patches in the trachea and pharynx, and in one rare case occurring in Brighton, a bleeding point was seen below the left vocal cord. Dr Felix Semon also saw the case and confirmed the observation. In the abdominal cases diarrhœa was immediately controlled by counter-irritation over the spine, on the ground of so many vasomotor symptoms present in all cases of this complaint. While the spleen was markedly enlarged in a few cases, this seemed to be exceptional, as it was not observed in slight cases to any extent. The tongue at first, with
closely adherent ash-like fur, developed a red streak down the centre. The necessity of the central sanitary department issuing orders as to the danger of exposure in all—even the slight cases seemed to be proved by this epidemic, and would have diminished the mortality to a great extent.

Dr Craig stated that he agreed with the remarks of Prof. Chiene in so far as he recommended prophylactic treatment. He, however, could not recommend these doses of corrosive sublimate to be taken for such a time as a prophylactic for any disease. In Prof. Chiene's cases 38 per cent. were affected with the so-called influenza, a much larger proportion than occurred among the medical students of Edinburgh. He asked if this might not be to a certain extent due to the corrosive sublimate having deteriorated the blood, and so have predisposed to the disease. He thought that the red iodide of mercury was a more powerful antiseptic than even corrosive sublimate.

Dr James Ritchie thought that the cough in influenza was neither purely nor mainly a nervous phenomenon. He believed that in all cases, even in the minor cases of the disease, there was a congestion of the whole respiratory tract, as evidenced by the condition of the nose and throat, and by the presence of râles in so many even of the milder cases. He believed also that this condition affected the bronchioles, and that this explained the tendency to the bronchiolitic attacks and the catarrhal pneumonias which occasionally occurred after exposure. Dr Buchan had pointed out that the mortality curve of influenza reached its highest in winter. which was just what might be expected considering that the fatal results were mainly due to respiratory troubles. Dr Ritchie believed that influenza was a zymotic disease; from his own observation he believed it to be infections, the conditions of infection being not yet understood; but he was impressed by the fact that it had over the Continent and also in Edinburgh first and extensively affected the Post-office officials, and the President now reminded them, those of the Foreign Office also. He believed that the poison of the disease, although it might not be able in every one to produce characteristic symptoms, lowered vitality and increased the fatality of other prevalent diseases.

 $Dr \ K. \ M. \ Douglas$ stated that 117 cases of undoubted influenza had occurred among the Post-office employés, but the illness had been in most cases slight, the officers remaining off duty for four or five days. In some instances absence of two or three weeks was necessary. The earliest cases were observed in October, and were regarded as febricular; the maximum number of cases was reached on Dec. 24th, and again on January 7th, and the latest cases had occurred within the last few days. The various divisions of the staff were indiscriminately attacked. Of 311 postmen who worked outside, 45 had the disease; of 306 telegraph clerks who were employed inside the office, 43 were affected; and of 187 sorters and stampers who likewise work indoors, 21 took influenza. He thus could not come to any conclusion as to the predisposing influence of exposure or of confinement indoors. Giddiness was a prominent symptom, and catarrh of the bronchial tract frequent, evidenced by moist râles and sibilation. Pneumonic patches were also observed, but very transitory, as Dr Brakenridge had stated, affecting one small area after another. Three cases of pneumonia occurred. One of these was trivial, and soon recovered; the second was somewhat peculiar, being ushered in by severe diarrhœa and vomiting. When first seen the temperature was 103°; the next day it was 106°. He became rather unmanageable, and he had to be removed to hospital, where he did well. The third case proved fatal, and was remarkable in the extreme prostration, the feeble and rapid action of the heart, which refused to respond to digitalis; and in the sputum, which, never rusty, was copious, frothy, and of a dirty brown colour. Then the subjects of chronic pulmonary disease were almost all attacked, and had been invalided for one, two, or three months. As to treatment, he found careful diet and confinement to bed in most cases all that was needed. Antipyrin appeared speedily to relieve the pains complained of. In one case the patient had neglected himself during the first twelve hours of the illness, and was found with coryza, suffusion of the eyes, and in a condition almost approaching coma. Twenty grains of antipyrin every two hours, till the third dose had been taken, were ordered. Next morning the temperature was normal and the pains relieved, but the prostration was very long continued after the attack. With regard to the question of contagion, he saw no evidence to support belief in the contagious nature of the illness. The post-officers lived all over the town, but in very few instances were others in the house affected, though occasionally this did occur. The cases occurred, however, as a rule simultaneously, and not one after another.

Dr Felkin said that it was too late to do more than make a few very brief remarks. In the cases of influenza which had come under his notice he had seen several with rashes. In one case miscarriage had taken place, in two abortion, and in another abortion threatened. In some of his cases a distinct relapse sometimes accompanied with a rash had occurred. Apart from these cases one of his patients suffered from pleurisy, two others from pneumonia, three from severe diarrhœa, and one from severe excitement, passing into delirium. Another suffered from abscess of the left tonsil. thought that those cases with marked catarrhal symptoms were contagious, the others not so. When he called to mind the large number of cases of dengue which he had seen, he could not help being struck by the similarity between it and the present epidemic. The sudden onset, the catarrhal symptoms, cough, and congestion of the fauces and pharynx, the acute pains, and especially the extreme and often long-continued prostration, and, as illustrated

by the cases mentioned above, the rashes, the liability to relapse, and the continuance of malaise and pains in the joints for some time after practical recovery—all this seemed to be more than a mere coincidence, and he should not be at all surprised did influenza turn out to be dengue modified by climate, and all he had heard that night strengthened his opinion. Another reason for this speculation was that it was known that dengue was very prevalent in East Africa at the beginning of 1889. Towards the summer it had made its appearance in Asia Minor and Turkey, spread thence to Russia, and they had good reason to believe that on this occasion the epidemic of influenza had followed a westerly direction, or might have been spread, as Dr Buchan suggested, by the winds. With regard to the epidemic, at any rate in Europe, one could not help thinking that the weather had influenced its spread, and it seemed as if the factors most concerned were-dryness of the soil, the absence of rain or snow, the absence of, or at any rate the very small amount of dew, the presence of low-lying clouds and high barometrical pressure. During November and December in the districts visited by influenza the barometer stood between 780 and 788 mm. for weeks at a time. And it was noteworthy that in most of Europe there was a period of almost absolute drought, lasting from 14 to 18 days, either in the second half of November or in December. He found that the number of dry days occurring in November and December in the following places was as follows-Moscow, 29 days; St Petersburg, 35; Warsaw, 46; Lemberg, 39; Vienna, 36; Prague, 51; Stockholm, 46; Königsberg, 39; Copenhagen, 47; Berlin, 44; Munich, 35; Magdeburg, 42; Brussels, 43; Paris, 44. It was well known in the tropics that the fall of heavy rains or the onset of cold wintry weather were the factors which checked the spread of dengue most effectually. With regard to treatment, he found that the administration of carbonate of potash, nitrate of potash, and quinine rendered good service after the first two or three days.

Dr Brakenridge desired to thank the members of the Society for the patient hearing they had accorded to his somewhat lengthy paper. He was glad to find that the discussion had brought out a variety of experiences and views, most of which tended to confirm the facts observed and the conclusions arrived at by him. Some observations made in different circumstances supplemented in an interesting manner the inevitable defects in his paper—for example, Dr M'Bride's observations on the ear complications, and Dr Felkin's on the influence of the disease on pregnancy. It was unnecessary to dwell upon these. At so late an hour he would confine his remarks to one or two points which had a direct bearing on the subject matters of his communication, and which seemed to require explanation. Assuming that the disease was ordinary epidemic influenza,—which was not conceded,—the statement, based on the Registrar-General's statistics, that in-

fluenza was essentially a winter complaint, because the mortality curve corresponded with that of diseases of the respiratory organs, contained a manifest fallacy. It was quite clear that the prevalence of a disease which in favourable circumstances tended neither to develop complications nor to end fatally could not be so estimated. In Dr Brakenridge's own 236 cases there had been no fatal case, and therefore no death-rate curve at all, but of course it would be absurd on that account to assume the absence of prevalence. It was quite possible-indeed, it was a fact-that during the warmer months or warmer weather such a disease might be very prevalent, but not at all fatal; and that during the colder months and cold weather it might be much less prevalent but much more fatal. Such a fallacy was exceedingly likely to occur in this disease, which did not tend to a fatal result except through chest complications, easily induced through exposure to cold. If the disease was dengue fever, which nearly all the military surgeons and officers whom he had met, or who had written on the subject, or who had seen both dengue and influenza, agreed with him in believing, then it occurred in its most typical form and greatest frequency in warm climates. The facts stated by Dr Allan Jamieson and others tending to show that those confined to their houses and warm rooms did not take the disease so readily as those exposed to the open air and cold, threw light on, but were certainly not opposed to Dr Brakenridge's observation that overheated dwelling-houses seemed to favour the occurrence of the disease. Indeed, Dr Jamieson's interesting observation that no patients in the City Hospital suffered from it, although several nurses took the disease, was rather, it appeared to Dr Brakenridge, to be explained on the ground that the wellnourished, healthy, and well-to-do were more liable to it than the poor and ill-conditioned. In the four instances Dr Brakenridge had given, the inmates of the overheated houses were healthy, well-conditioned individuals, freely exposed to the open air during the greater part of the day. He could affirm from his own experience, that every period of cold weather had brought a diminution in the number of new cases, and every period of warm weather an increase. Dr Andrew Balfour's statement that the disease had prevailed to a considerable extent in the working classes was quite consistent with the statement that the rich and well-to-do had suffered more than the poor and ill-conditioned. It accentuated the fact that the working classes deserved, at the present day, to be included among the well-to-do and well nourished. Regarding the post-mortem conditions observed by Dr Barrett, while Dr Brakenridge had met with, during the prevalence of the epidemic, many cases of dry pericarditis, he had not been able to associate the tendency to that complication with the so-called influenza. As to the lung and kidney complications which Dr Barrett had described, they had to remember that it was admitted that all the

fatal cases at Morningside Asylum had occurred in weak, brokendown lunatics; and it was clear that great caution must be exercised in connecting with the present epidemic disease as their cause any post-mortem appearances, even those indicating recent disease, met with in such cases. In reply to Dr M'Bride's question, he might state that he had found the spleen enlarged in some, but certainly not all of his cases; occasionally the enlargement was of short duration.

Meeting VIII.-March 19, 1890.

Professor A. R. SIMPSON, President, in the Chair.

EXHIBITION OF PATIENTS.

Dr John Thomson showed two cases of HABIT SPASM, or HABIT CHOREA. The former name was that which was applied to the condition by Dr Gowers, the latter being used by Dr Weir Mitchell and other American writers. In some German works the same affection was described under the name of chorea electrica, although it had, of course, nothing to do with the Italian malarial disease known under the same name. It had also nothing to do with ordinary chorea minor, from which it differed in many ways,there was none of the inco-ordination and general restlessness characteristic of that disease, but the patient was able to perform any ordinary movement or work quite well with triffing interruptions, and during the intervals between the muscular contractions was quite at rest. The course was also different-this disease often, as in Case I., lasting much longer than ordinary chorea ever did. The disease consisted in the occurrence at varying intervals of sudden, momentary, muscular contractions, resembling those produced by the passage of a weak galvanic current. These sometimes occurred in the corresponding muscles, and at the same time on the two sides of the body; but as frequently the muscles affected on the two sides were different, and even when they were the same they were affected at different times. The movements ceased during sleep; they were aggravated by emotional excitement; they could be controlled for a considerable time by voluntary effort, but not entirely.

CASE I.—A girl (E. F.), 12 years old. The distribution of the spasmodic movements was as follows :—(1.) Constantly recurring winking of the two eyes, usually together, sometimes alternately. (2.) Backward and forward movement of the entire scalp. (3.) Twitching upwards of the right angle of the mouth. (4.) Twitching downwards and outwards of the left angle of the mouth,—this, when severe, being occasionally accompanied by a movement of

the lower jaw to the left and a spasmodic contraction of the left sterno-mastoid. (5.) Shrugging of the shoulders. (6.) Pronation and supination movements of the forearms. (7.) Very strong and constantly recurring contractions of the quadriceps femoris.

All the movements were slightly stronger on the left side. The tongue, when protruded, showed slight vermicular movements in its substance, as seen in chorea minor. The knee-jerks were usually rather hard to elicit, but when percussion was made on the tendon at the moment of a spasm, a very much exaggerated movement of the leg occurred. As to the duration of the disease,—the left eye and the shoulders had been affected for five years, the right eye for about three years. The movements of the face, arms, and thighs were first noticed about six months ago, and those of the scalp about two or three months ago. The child's general health was tolerably good, but for about a year she had suffered from time to time from night-terrors, and she had chronic hypertrophy of the tonsils and of the adenoid tissue in the naso-pharynx.

The child had been under treatment at the New Town Dispensary for several months, and had had a fair trial of liq. arsenicalis and bromide of potash; she was now getting Easton's syrup. Dr M'Kenzie Johnston had drawn Dr Thomson's attention to the fact that spasmodic nervous affections of this nature were sometimes dependent on morbid conditions of the naso-pharynx, and the effect of local treatment of the naso-pharynx was about to be tried in this patient. The well-known fact that night-terrors such as she suffered from were often cured by attention to chronic conditions of the throat, seemed further to encourage the hope that local treatment might be successful.

CASE II.—A boy (A. S.), aged 6 years, suffering from a much slighter degree of the same affection, the only symptoms being a regularly recurring winking of the two eyes (simultaneous), and an occasional irregular twitching of the angles of the mouth. He was also said to have a peculiar, short, nervous cough. He had only been affected for ten days. Like the other patient, he had chronic enlargement of the tonsils, and he also suffered from thread-worms. He was otherwise healthy.

Dr Thomson also showed a LITTLE GIRL, aged 5, with a lesion in the region of the right crus cerebri. She also was a New Town Dispensary patient, having been sent by Dr J. C. Webster. Her symptoms were,—Paresis of the left arm and leg, with weakness of the face on the same side, including the orbicularis palpebrarum ; paralysis of the third nerve on the right side, which caused ptosis of the right eye, dilatation and immobility of the pupil, inability to turn that eye to the left, diminished upward and downward movement of it, and constant turning of the head to the left side. There was congestion with ædema of the optic dises. The child sometimes complained of slight headache. There was considerable mental torpor. There had been no vomiting and no fits. Sensibility was intact. The power of accommodation of the left eye seemed perfect. The child had never had diarrhœa. The weakness of the left side of the face had been noticed seven weeks ago, that of the arm and leg four weeks ago, but for from four to six weeks before that the child had occasionally complained of cramps in these limbs. The ptosis had been first noticed three weeks ago. There was no family history of tuberculosis, and no history of syphilis. The distribution of the paralysis indicated some lesion, probably a tumour, in the region of the right crus cerebri, but there did not seem to be sufficient data to justify a positive diagnosis of the nature of the lesion. In all probability, however, it was a tubercular mass.

Meeting IX.—April 2, 1890.

Professor A. R. SIMPSON, President, in the Chair.

I. EXHIBITION OF PATIENTS.

1. Dr John Thomson showed a case of SPORADIC CRETINISM (Cretinoid Idiocy), with an ædematous or (?) myxædematoid condition of the right side of the body. The patient (I. J.) was 19 months old. She was the elder of two children, the other being apparently healthy. The parents were born, and had always lived, in Edinburgh. No relatives had been affected in a similar way, nor with goitre. The child's birth was not difficult. The mother had been subject to fits (probably epileptic), and had many of these during her pregnancy; she had also had a good deal of work and worry during that time. The most remarkable feature of the case was the swollen, apparently œdematous condition of the subcutaneous connective tissue, which condition was almost confined to the right half of the body. On the face this was present on both sides, though markedly more on the right side. The right ear and the right upper and lower extremities were all much affected, and a great deal larger than the corresponding parts on the left side, which (with the exception of some slight puffiness of the left instep) seemed quite normal. The right labium minus was so much swollen as to be more than six times as large as the left, and it projected out of the vulva. The swollen tissues pitted on pressure to some extent. The condition had been noticed within ten days of birth. The long duration of the swelling, the look of some of the swollen parts, and the nature of the case, seemed to suggest the possibility that the pathological condition might be analogous to that found in cases of myxcedema. The child was a little below the average size (28 inches), she was pale and flabby, and had a large protuberant abdomen, but otherwise her general health was not

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interfered with to any great extent. The face was broad and swollen, but not otherwise very characteristic. The hair was plentiful and good. There was no special abnormality of the cranium or skeleton. The palate was normal; the tongue seemed a little large; the ears were badly developed; the neck was short, and very thick from accumulation of fat. No thyroid gland could be felt, and the isthinus was certainly wanting. The hands were rather narrow, and the fingers long and slender. There were accumulations of fat in the axillæ and supra-clavicular spaces. The largest was that in the left axilla, which was about the size of half a small orange, and surrounded four or five glands which dated from vaccination a year before. That in the right supra-clavicular region was about the size of a walnut, and contained two glands. The corresponding one on the left side was about two-thirds of that size, and contained no glands. That in the right axilla was so small as to be scarcely noticeable. The child's mental condition was distinctly deficient and peculiar. She emptied her bladder and bowel without giving any warning. She was extremely shy, and averse to being even looked at by strangers. She was particularly fond of animals, but very jealous of other children. She was tolerably observant, and very fond of bright colours. She could say one or two short words, but her mother thought that her mental condition was getting worse. The case was regarded as a slight one of the form of genetous idiocy described by Dr Ireland as cretinoid, and by many other writers as sporadic cretinism.

2. Dr Allan Jamieson showed-(1.) LYMPHANGIOMA CIRCUM-SCRIPTUM. On the right shoulder of this little boy, aged 8, extending inwards for about three inches, will be seen a cluster of vesicles closely aggregated together, having a somewhat warty aspect, though on the first glance not at all unlike the vesicles in herpes zoster. His mother states that the first ones appeared when he was a few months old, and that fresh ones have come out from time to time since, while others have vanished, leaving no trace. Thus there was at one period a group nearer the spine. Running over several will be seen vascular tufts or striæ. The vesicles themselves have very resistent walls, and are evidently deep-seated. All agree that they are connected with the lymphatic system. When punctured, a clear fluid escapes, alkaline in reaction, and containing a few lymph corpuscles. Sangster found in one of Mr Hutchinson's cases flask shaped spaces in the corium, due, he believed, to dilatation of the lymphatics. Only about ten cases have been recorded, and a good representation of four of these will be found in the first part of the International Atlas of Rare Skin Diseases, now in course of publication. The disease has been met with on the face, neck, deltoid, and scapular regions, on the arm, thigh, and back; it most commonly occurs in males, and is limited to one locality in the same person. It differs from

lymphangioma tuberosum multiplex of Kaposi, inasmuch as the little tumours in the latter are solid, and are scattered irregularly all over the body. Recurrence has, according to Crocker, taken place after destruction by caustics or excision in or near the scar. I propose to try in this case the salicylic and creasote plaster muslin of Unna, which has proved of such value in lupus. I should have mentioned that I am indebted to my friend and former assistant, Dr Blaikie, for the opportunity of studying this rare case. (2.) NÆVUS PUNCTIFORMIS. A tall, well-grown lad, aged 18. Some five or six years ago he noticed a small red mark on his right forearm, near the elbow, after practising on the horizontal bar, and the number of these for a time steadily increased. For at least two years, perhaps longer, no fresh ones seem to have come out. The eruption will be found scattered with some degree of regularity over the deltoid region, the back of the upper arm, both aspects of the forearm, and is even faintly discoverable on the wrist and on the back of the hand. It consists of patches, which, on close inspection, are seen to be made up of minute dots of a bright or dark red colour-some, indeed, are rather very short lines, and between these the skin is a very pale pink. The puncta are grouped, are extremely superficial, and are not, apparently, connected with hair follicles. It is difficult to say whether they fade much on pressure, but they certainly do not disappear, and when frozen by the ether spray are still visible. Besides those on the arm there are also several groups running along the margin of the fifth rib on the right side. In November 1888 Dr Edington, then my assistant at the Royal Infirmary, cut out a small portion of skin, including some puncta, and made sections of this. The epidermis was normal, but at the apices of some of the papillæ were small collections of blood, apparently in a condition of stasis, as in some a small crystal was discoverable. There were also prolongations of the rete Malpighi found dipping down into the corium. These, Dr Edington thought, embraced the extravasations, and cut them off, but this I have been so far unable to verify. The condition seems to be a nævus, extremely superficial, and associated with punctiform venous capillary stases. I was much interested to find in the January number of Mr Jonathan Hutchinson's Archives of Surgery a case almost exactly similar described, and illustrated by a figure which might with scarcely any change have been drawn from mine. The interest in both instances is the spread of the process, not by a continuous edge, as in ordinary capillary nævus, but by the formation of new foci, by the production of satellites. Mr Hutchinson regards the complaint as related to Lymphangioma circumscriptum, or, as he prefers to label it, Lupus lymphaticus. In the latter are to be seen little tufts of capillaries, and, according to Mr Hutchinson, it has been met with in connexion with portwine mark. He also states that both are apt to leave scars, very faint, it is true, but still appreciable. Such, however, are not

visible in either case as here represented. (3.) PITYRIASIS RUBRA PILARIS. A furnaceman, aged 26, who has enjoyed excellent health. On the 13th July of last year he believes he got a chill, and shortly after the present ailment commenced on his face, and thence spread till the entire surface is involved. He exhibits a typical example of a disease the precise nosological position of which is perhaps not yet quite defined. We owe our acquaintance with it mainly to French authors. Originally described by Devergie, it is to Brocq, to Cæsar Boeck, but particularly to Ernest Besnier, the famed professor at the Saint Louis Hospital, Paris, who last year published an exhaustive account of it in the Annales de Dermatologie, that we are indebted for our information concerning it. The name conveys a good conception of the complaint. Pityriasis connotes the exfoliation of fine, dry, white scales; rubra, the substratum of pretty intense and universal redness; and pilaris, since the hair system is markedly involved. It is not, however, limited to the parts provided with hair follicles, for a peculiar dryness and scaliness of the palms, and an interference with the nutrition of the nails, are met with in cases which last long. With all this there is little observable disturbance of the general health. Some, occasionally very severe, itchiness accompanies it, most pronounced at night. There is dryness of the hair and much dandruff. The lanugo becomes broken off, and our patient states that the hair on his face has become decidedly thinner. It is easy everywhere to make out the acuminate red papules which are so prominent a feature. On the chest these are well pronounced; on the arms their definite relation to the hair system is distinct, along with epidermic accumulations round the mouths of the follicles, not now so great as they were before treatment was commenced. At one time, when he first came under notice, the arms seemed as if covered with a coating of mortar, the skin was bound down and somewhat torn from scratching. As a result of nightly baths of potassa sulphurata and starch, which he has had in Ward 31-to which, through the kindness of Dr Wyllie, he has been admitted-the skin has assumed a softer and more pliant aspect and feel; on the legs, but especially on the nates, there are to be seen dull purplish-red papules, not unlike those of lichen ruber planus, but acuminate, not glancing, and each bearing a small scale on its summit. Between these the integument will be seen to present a somewhat tawny appearance. The face is red with papules and blotches, and flakes of a fine branny dust. On the neck the condition more resembles eczema than elsewhere; perhaps from exposure, motion, and washing, some degree of eczema has really been superadded. It will be seen that it does not present the multiform character of an eczema, while it differs from the lichen ruber acuminatus of Hebra, inasmuch as the health has not suffered, while though he has been treated continuously with arsenic, regarded by Hebra as a specific in lichen, he has derived

no benefit whatever. The diagnostic points have been so well stated by M. Besnier that I cannot do better than quote his words. "The thick, greasy, pityriasis-like deposit on the scalp, the scaly redness of the face, with tension of the skin and a slight degree of ectropion, or its uniform envelopment by a dry, plaster like, adherent coating, the minute white, gray, or red scaly xerodermic prominences, having a hair in the centre, and notable on the dorsum of the phalanges as their favourite locality, the symmetrical exfoliation of the palmar and plantar surfaces, the alterations of the lower segment of the nails and of their bed resembling rush-pith, the branny redness of the skin, with fine exaggeration of the cutaneous folds, the subacute course, gradual or chronic, the absence of severe constitutional symptoms, etc., etc., make this disease, when thus pronounced, one of the most characteristic and easiest of recognition." The disease is certainly rare, and has probably been confounded with eczema, with lichen ruber planus, with lichen pilaris, and with some cases of psoriasis. The treatment so far has been the baths above mentioned, and the subsequent application of a paste of equal parts of sesame oil, lime water, prepared chalk, and oxide of zinc, with two per cent. of salicylic acid; under this the itching has ceased, and the skin has already, in less than a fortnight, become much improved.

II. EXHIBITION OF SPECIMEN.

Dr John Thomson showed a SUPERNUMERARY COSTAL CARTILAGE removed post-mortem from an otherwise well-formed infant. The supernumerary cartilage articulated with the sternum on the right side, half-way between the cartilages of the 3rd and 4th ribs, and passed outwards between these ribs, ending in the muscle in a sharp point about 1 inch beyond the line of the costo-chondroid articulations. It was considerably narrower than the normal cartilages.

III. ORIGINAL COMMUNICATIONS.

1. MOTOR PARALYSIS RESULTING FROM THE HYPO-DERMIC INJECTION OF ETHER. Illustrated by Two Cases.

By DAVID WALLACE, F.R.C.S. Ed.

PHYSICIANS and surgeons have very frequently to use hypodermic injections, and fairly definite rules are laid down both as to the method to be adopted and the preparations to be used in this mode of exhibiting drugs. In cases of syncope and collapse, rapidly diffusible stimulants have to be administered, and their administration is preferably carried out by hypodermic injection, that being the most certain and most rapid method of attaining the desired result. My object in this short paper is to draw attention to an accident which may result from the injection of ether, an accident which I can illustrate by two cases.

The diffusible stimulants used for hypodermic injection are chiefly ethers, alcohol, and ammonia. Of the former various preparations are recommended, but those chiefly used are ether sulphuricus, spiritus etheris, and ether purus. Alcohol may be used either in the form of brandy or whisky. These preparations are made up of the following percentages :—*Ether sulphuricus* contains 92% of pure ether and 8% of alcohol and water; *spiritus etheris* contains one part of ether to two parts of alcohol; while *ether purus* is pure ether, 100%. Whisky and brandy have each 50% of alcohol. Alcohol has a special affinity for nerve tissue, which it rapidly coagulates and hardens. Ether also has a special affinity for and causes coagulation of nerve tissue. Ether is more readily diffusible than alcohol, and is, therefore, used in preference to it where we wish a very rapid effect, as in cases of collapse and syncope.

For the hypodermic injection of ether there are two generally recognised methods,—1st, it may be injected subcutaneously into the cellular tissue immediately under the skin; or, 2nd, it may be injected deeply into the belly of a muscle. When we use the former plan there may be a little emphysema produced by the rapid volatilization of the ether, and the small operation is associated with a little pain. If, on the other hand, we inject the ether deeply into a muscle, there is no pain, but there is a risk of a deep-seated abscess forming. Ether is, however, a powerful antiseptic, and therefore, even if the needle used for the injection be not absolutely aseptic, the risk of this latter accident is small.

CASE I.—During the evening of January 15th of this year I was watching a patient who suffered from an acute inflammatory swelling in the neck, which had been freely incised an hour or two previously. The patient suddenly became collapsed to such a degree that the radial pulse was imperceptible. As rapidly as possible I gave an injection of ether hypodermically, pushing the needle into the most accessible part of the body, viz., the extensor aspect of the left forearm at the junction of the lower and middle thirds. I injected about 20 minims of ether sulphuricus. The patient recovered from the collapse, but next morning I was struck by the fact that he had paralysis of the extensor group of muscles of the forearm. On analysis of this paralysis, I found the whole of the muscles supplied by the posterior interosseous nerve completely paralyzed. There was, however, no "drop wrist," the extensor carpi radialis longior serving to prevent this. It was obvious that the paralysis was due not to compression of the musculo-spiral nerve during sleep, but to some cause affecting its chief muscular branch, the posterior interosseous nerve. Common sensibility was unaffected.

CASE II.—On 28th January, ten days after the occurrence of Case I., Professor Chiene had occasion to perform excision of the testicle. Towards the end of the operation it was observed that the patient was very pale and the pulse small and weak. It was deemed advisable to inject ether, and this was done by the doctor in much the same way as in Case I. At the most accessible part, the back of the forearm, 20 minims of ether sulphuricus were injected deeply, the needle being pushed as rapidly as possible into the arm. On the following day the patient was discovered to have paralysis of the muscles supplied by the posterior interosseous nerve, although not to such a marked extent as in the first patient, as he still retained some power of extending the ring and middle fingers.

The first case having been more directly under my own observation than the second, I may describe to the Society its subsequent history, dismissing the latter case with the remark that at the present time (nine weeks after the occurrence of the paralysis) the patient has not fully regained the use of his hand, although voluntary power of the affected muscles is gradually returning.

The subsequent history of Case I. has been as follows :-- During the first week the patient was so ill that nothing could be done to treat the paralytic condition other than placing the hand in the most comfortable position for the patient. At the end of the week massage was begun and regularly used twice daily, while the patient was at the same time directed to constantly endeavour to use the muscles, the power of which had been lost. This treatment was continued for one week, but gave rise to no improvement. Blisters over the course of the posterior interosseous nerve were then applied, but their application produced no visible change in the condition, and it was therefore decided to use electricity. Faradism produced no contraction of the muscles, even when the current was sufficient to cause severe pain. Galvanism was therefore had recourse to. On 14th February, one month after the paralysis occurred, Dr Wyllie-who kindly undertook the electrical treatment-examined the arm earefully. He found the only muscles of the outer border and back of the forearm not paralyzed were the supinator longus, the extensor carpi radialis longior, and the anconeus, i.e., all the muscles supplied by the posterior interosseous nerve were paralyzed. They were at the same time markedly atrophied. The other muscles of the forearm were in their natural condition. The common sensibility was unaltered. The current produced by 45 Leclanche cells-a current sufficient to pass through the extensor muscles to the flexors-was required to get contraction of the affected muscles on the first day of the application, but two days later the current from 27 cells produced an equal amount of contraction. After the daily application of galvanism for one week, the muscle contractions were sufficient to partially extend the thumb and fingers.

On 8th March—that is, after three weeks of galvanism—the wasted muscles were found to have greatly increased in bulk and firmness, and their passive resistance to the flexors was such that the fist could be firmly closed. There was, however, no power of voluntary movement.

On March 15th, eight weeks from date of paralysis and after four weeks of galvanism, the middle and ring fingers could be voluntarily extended, and a week later the little finger could be extended, while slight abduction of the thumb was got by the action of the extensor ossis metacarpi pollicis and extensor secundi internodii pollicis. The primi internodii pollicis was still devoid of any voluntary movement. At this date the interrupted current was again tried, but stimulation of the musculospiral or posterior interosseous nerves had no visible effect on the extensors.

Present Condition.—The patient has rather more power of abducting the thumb, and can slightly dorsiflex the fingers. The hand generally is much more useful. The muscles which have their nerve supply from the highest part of the posterior interosseous nerve are those which can be chiefly used by the patient, *i.e.*, those muscles supplied by twigs furthest away from the point of the injection of the ether.

The gradually increasing strength of the muscles may perhaps be better gauged by the result of dynamometric examinations made at stated intervals:—

On 22nd February, with left hand 70 lbs., right 275 lbs.

,,	18th March	,,	,,	80	,,	"	,,
,,	1st April	,,	"	170	"	,,	>>

For an explanation of the paralysis two thoughts naturally suggest themselves-first, that the posterior interosseous nerve trunk was pierced by the needle, and the ether injected directly into the trunk of the nerve; second, that the ether used was a bad preparation, and had a neurolytic action, or that it had a local toxic action which affected the nerve just as in lead or alcoholic poisoning. The latter explana. tion can be dismissed, as on testing the ether it was found to be a good preparation. The former explanation has to be considered from an anatomical point of view. Normally the posterior interosseous nerve trunk would be situated about three inches above the point where the needle was introduced, and if we subtract an inch from that distance for the length of the needle, the nerve trunk would be still two inches distant. The likelihood of an abnormal distribution of the nerve is minimized by the accident occurring in two cases, but further any abnormality of the nerve is very rare. Quain does not mention any example of its occurrence.

The explanation would rather seem to be that the ether after injection would diffuse most rapidly through the intermuscular spaces, and as it is in these that the nerve branches chiefly lie, the ether

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coming into contact with these branches would cause coagulation and destruction of the constituents of the nerves, and in that way destroy their conducting power. Then the immediate local effect would probably be followed by some degeneration of the nerve going to a higher level, while neuritis would be set up as indicated by the pain felt by the patient during the first three or four weeks of the paralysis. This explanation is borne out by an experiment performed by Lauder Brunton and his assistants, and quoted by the former in the Croonian Lectures on the Relationship between Chemical Structure and Physiological Action.1 The method employed in this experiment was to take "the sciatic nerve of a frog with the gastrochemius muscle attached, so that its contraction and non-contraction when the nerve was stimulated might serve as an index for the presence or absence of functional activity in the nerve. Alcohol and ether, when applied so as to act on the nerve trunk, destroyed conductivity before irritability, so that stimulation applied to the nerve further away from the muscle than the part acted on by the ether gave no effect, while when applied nearer the muscle than the part affected by the ether there was contraction of the muscle."

Since these two cases have come under my notice I have tried, in every way open to me, to find references to similar cases, but have only succeeded in finding one, which was kindly supplied to me by Dr Lauder Brunton. There is no mention of such an accident in any of the medical works to which I have referred, including some, I may mention, as representing medicine, therapeutics, and nerve injuries and diseases—Ziemssen's *Cyclopædia of Medicine*, Reynolds' System of Medicine, Quain's Dictionary, Hilton Fagge, etc. In therapeuties, Ziemssen's General Therapeutics, Lauder Brunton, Wood, Bartholow, Ringer, Phillips, etc. In nerve diseases and injuries, Duchenne, Ross, Gowers, Mitchell, etc. In Neale's Digest there is no reference to any journal which contains a note of any such accident.

The reference given me by Dr Lauder Brunton, to which I have alluded, is contained in the *Revue de Médecine*, Bordeaux.² Unfortunately I have been unable to get the complete paper, but the following abstract is contained in the *Revue de Médecine*, Paris, under the heading, "Paralysis following the Injection of Ether." In this paper four cases are quoted in which paralysis occurred in the muscles near the point where injections had been practised. "Sans décider du mode d'action de l'éther sur la fibre musculaire ou sur les terminaisons nerveuses, et malgré une étude incomplète de la paralysie, M. Arnozan fait ressortir les points suivants.

" 1. L'injection d'éther dans les muscles produit la paralysie de ces muscles.

¹ Lauder Brunton, British Medical Journal, 6th July 1889.

² Arnozan, "Paralysies consécutives à des injections d'éther," Journal de Médecine de Bordeaux, 1881-82, pp. 526-529. "2. Ces paralysies offrent des analogies très grandes avec les paralysies périphériques du facial par exemple suppression ou diminution de l'excitabilité faradique, augmentation de l'excitabilité galvanique, retour du mouvement volontaire avant celui de l'excitabilité faradique.

"3. Elles guérissent spontanément, mais avec une assez grande lenteur. Leur guérison par l'application de courants galvaniques est beaucoup plus rapide."

I have thought these two cases of paralysis succeeding the injection of ether well worthy of notice, because in none of the various text-books are we warned of the possibility of such an accident as I have described occurring; and further, the accident, when it does happen, is a most awkward one, causing very great inconvenience, it may be, to the patient, and necessitating prolonged and careful treatment on the part of the medical attendant. The two cases I have quoted seem to bear out the conclusions arrived at by M. Arnozan :—

First, That paralysis may be caused by the injection of ether deeply into muscles.

Second, That the prognosis is favourable, and although recovery may be long delayed, yet it does take place.

Third, That galvanism hastens the cure in a very marked fashion.

Further, I think that the possibility of such an accident occurring indicates that when we use hypodermic injections of ether the ether should be introduced subcutaneously; but if put deeply into a muscle, we should choose a fleshy muscle, such as the deltoid or gluteus maximus, where there is less risk of the ether in a concentrated form reaching the nerve branches than when it is injected into such a part as the extensor aspect of the forearm. In future I shall, even in cases of threatened syncope, take the little while necessary to pinch up the skin and inject subcutaneously.

Professor Chiene congratulated Mr Wallace on the clearness and succinctness of his paper. The speaker had learned that in future when he had to inject ether he would inject it into the subcutaneous tissue, and not into the substance of a muscle. Judging from the after results in those two cases, Mr Chiene was of opinion that it was important to take every care in the injection of ether.

Dr James Ritchic asked whether the rarity of the condition described by Dr Wallace might not be due to the infrequency of the injection of ether into muscle. Ergotine was usually injected into a muscle, was not ether given subcutaneously? He asked for information.

Dr Wallace, in the first place, thanked the members of the Society for the very kind way in which they had received his paper. No doubt it was most usual to inject ether subcutaneously, but some physicians recommended that it should be injected deeply into a muscle, and in some cases, as in those he had just quoted, the desire of the surgeon was to introduce the needle at the most accessible part, and in the most rapid way. He wished to warn medical men against the injection of ether into muscles unless the muscle chosen was a large and fleshy one.

2. ON THE PATHOLOGY AND SUCCESSFUL TREATMENT OF CHRONIC TROPICAL DIARRHŒA (KNOWN AS SPRUE).

By CHARLES BEGG, M.B., C.M.

MR PRESIDENT AND GENTLEMEN,—I have first to thank you for allowing me to appear before you to-night, more especially as the disease of which I shall speak is one which can have little more than a scientific interest to you.

Still, there may be some present who, having been abroad, have seen cases, and others who have had to treat patients sent home in search of health, and all of you are in a position, some preeminently so, to discuss the all-important question of the probable true nature of the disease, and to criticise the statement I shall make, namely, that I believe the present view of its pathology to be wrong. That statement I confess at the outset to be the result of clinical experience, and not from laboratory demonstration. In a disease pronounced by the profession to be incurable, one may be forgiven if he is anxious to bring successful clinical work before the notice of his fellow-practitioners abroad, in order that they may test it without waiting to have his theories confirmed in the laboratory. For although the question in this country may be but a scientific curiosity, yet it is one of great practical importance abroad, the disease being one which ruins the life and prospects of hundreds although rarely in itself fatal. The present attitude of the profession towards it is to pronounce it incurable, unless the patient at once return home, and live for long periods on a pure milk diet. It is one of those border-land diseases where it had been better for patients were it more fatal. The condition of things would then have been *observed*, and not, as at present, merely inferred.

Sprue has been defined to be a disease of and originating *in* the mucous membrane of the intestinal tract. The symptoms indicating an irritable, defenceless condition of the whole mucous membrane from mouth to anus, ending eventually in atrophy. Treatment is pronounced a failure.

My position shortly stated is, that I believe we are mistaking results for the initial cause, and that the true cause is an alteration in the products of digestion induced by the agency of an organism, and that all changes, if any, in the mucous membrane are secondary.

Dr Manson's admirable description of this disease is but the tobe-expected history of a patient suffering from an unchecked diarrhœa or other intestinal lesion interfering with the proper assimilation of the nourishment taken.

Dr Van de Burg, in speaking of the etiology of sprue, states that although he believes it to be climatic, yet it does not attack new arrivals, and is less frequent in dark races than among Europeans,—facts to my mind strongly pointing to a parasitie or microbic origin. Thus interpreted, it would mean that some time was necessary to elapse after arrival in the country to allow of the introduction and multiplication of the microbe, and the fact, if fact it be, that the dark races are freer from it, would be accounted for by the microbe or parasite finding a more favourable nidus in the intestinal canal of the European, or, which is more likely, depending on some question of diet. I can speak from the experience of a large Chinese hospital, and I find the disease, or a very good imitation of it, by no means uncommon.

Dr Thin has recently published a pamphlet on a series of six carefully recorded cases of sprue, and I shall quote in extenso his remarks on the most prominent symptom-namely, diarrhœabefore doing so. I would say that all observers remark on the clean appearance of the tongue, and its participation only in sympathy with the disturbance of the system and after the disease has existed for some time, or in a patient who has yielded very rapidly to the morbid influence. Dr Thin remarks that many of his patients appear on superficial examination to be perfectly well, others exhibit the appearance of persons fatally stricken by some wasting disease. Regarding the diarrhea he says, "Although diarrhœa is sometimes a prominent feature, indeed, occasionally the chief feature of the disease, it is not invariable. The condition of the bowels may be more accurately described as irregular. When the disease has got hold of the patient he never passes a healthy motion. There are patients who, for many years, have never had a healthy stool, but yet have seldom suffered from what could be called diarrhœa. When diarrhœa is present it is often serous, the evacuations consisting of a frothy, pale yellow, or claycoloured, or brown, more or less pulpy mass. Sometimes the bowels are actually constipated-small, hard, dark coloured lumps being passed. Mucus is not a characteristic of the stools, although sometimes a considerable number of white mucous flocculi are present. One characteristic of the disease is in some cases the presence of very large motions in excessive proportion to the food taken, indicative of a suspension of the absorbing power on the part of the mucous membrane." A careful consideration of this description to my mind agrees perfectly with my theory as to the causation of the disease. The fault would seem to

be after digestion has taken place, for all observers agree in allowing that the motions when examined with the microscope are free from undigested food, with perhaps the exception of a few muscular fibres and vegetable structures, not to be wondered at being found under the circumstances. My position is made even stronger by Dr Thin's statement, that "although in severe cases the microscope detects epithelial cells among the flocculi, still a characteristic feature of the disease is the absence in the motions of any signs of inflammation of the mucous membrane." And yet these observers are still content with the definition of the disease given above, although it seems to me they fail to point to a single fact in support of any diseased condition of the mucous membrane existing, and only prove that the mucous membrane has failed in its function of absorbing the food prepared for it by the process of digestion; and as these processes are conducted at different parts of the intestinal canal, I think they will find it difficult to explain why one part of the tube is able to do its duty and not another. As far as I can see, we must except the mucous membrane of the stomach from this mysterious morbid process. We have ocular demonstration that the motions do not contain undigested food. To allow of the digesting of the food taken we must suppose that the machinery by which that result is brought about is in a healthy condition ; whereas, if the definition of "an irritable, defenceless condition from mouth to anus" were true, one would naturally expect the stomach to be the seat of the greatest irritability; it is certainly the hardest used part of the tube, and ought to be the first point to give in.

On the other hand, we have proof that although the motions do not contain undigested food they are not of a healthy or normal character, and I believe we find the secret in them. The state of the mucous membrane of the tongue, as seen in bad cases or in late stages of the disease, is certainly "irritable and defenceless," but it is allowed to be only of a secondary nature, and is but what is usually seen in similar conditions of malnutrition, the result of other diseases.

The only records of laboratory work I know of in connexion with finding out something about the organisms found in the motions are also the work of Dr Thin. He cultivated organisms from Case I., and his results are most favourable to my theory, although he does not attach *the same* importance to them. Shortly stated they are as follows:—Out of a number of organisms contained in a minute drop of fluid motion thirteen distinct organisms were isolated; each was developed on gelatine, and was perfectly distinctive. Inoculations on fresh gelatine were made once a week. After a little more than two months none of these could be further cultivated. One bacillus behaved in a distinctive manner, and Dr Thin's attention was drawn to the fact that on several occasious the worse the stools were from the point of view of symptoms, the greater was the proportion in which the bacillus was present.

My theory of a special organism entering and multiplying in the intestinal canal, and by its action rendering the products of digestion inimical to absorption, will satisfactorily account for all the clinical phenomena. I did not see Dr Thin's book until after this conviction had been forced on me by the result of clinical experience. It is an additional fact in support of my theory that the present method of treatment is to place the patient, after sending him home, on a special diet for long periods. The diseased membrane is still called on to act, but care is taken that only a special substance, milk, is given it to act on. It may be argued that under milk's bland influence a healthy tone is recovered, but it is difficult to understand why, with a proper wholesome mixed diet, things should ever have gone wrong; and it is also difficult to explain why, if it be a fact that the structure be diseased, the function should be generally in excess instead of in abeyance, namely, appetite instead of anorexia. Whereas, if we argue that a mixed diet not only introduced the microbe, but contained substances favourable to the growth and well-being of the unknown organism, and in the prolonged use of such a substance as milk we supply the system with nourishment but not the bacillus, and that it is in time starved out of existence, we have at least a reasonable plan to work on. When I add to the above that I have found in practice a drug that very quickly cures such cases, I trust I shall have made out a strong enough case to lead to a reconsideration of the present accepted pathology of the disease.

I have confined my remarks to what constitutes the disease; all the other symptoms presented by patients are allowed by all to be secondary.

Sir Joseph Fayrer's book on *Tropical Dysentery and Chronic Diarrhæa* contains an exhaustive account of post-mortem appearances seen in these diseases in India, and he affirms the identity of sprue with the hill diarrhæa of that country. It requires careful reading to pick out the cases which may be of use to us in our present inquiry.

He states that the opportunities for studying the morbid changes in ordinary examples of the disease are not frequent. On the changes seen in chronic diarrhœa he remarks as follows :----

"In some chronic diarrhœas, especially those with the white flux (that is to say, cases of sprue), in spite of the long duration of the disease, little or no change of the mucous surface is to be found. There is great thinning of all the coats of the small intestines, so that they are quite translucent, and there is doubtless atrophy of the glandular tissues."

He also records in various subjects, victims of chronic diarrhœa from all causes, extensive changes which I need not take up your time in detailing, but it is worthy of note that the condition of the other organs of the same subject were in a similar condition. And we must remember the kind of subjects examined. They were either victims of famine, or from the jails, or those who had died in hospitals in very advanced stages of their various diseases. I do not know of a record of a post-mortem on a patient in the condition which we recognise and are called on to treat as sprue such, for example, as had existed in my last patient for 19 years.

Treatment.—In dealing with cases of chronic tropical diarrhœa I had very soon to confess to failure. It then struck me that there might be another explanation of the symptom constantly present —namely, the clean tongue—which I had learned to take as my guide when treating patients in China as indicating the presence of ascaris lumbricoides, no matter how various were the symptoms manifested. I therefore gave santonine. In not a single case where I could make a diagnosis of sprue did I ever see a parasite of any kind in the evacuations, but all the distressing symptoms of the disease yielded to a course of santonine. From the difficulties of laboratory work in China, I have been unable to do other than clinical work at this subject.

As a typical example of the class of cases under review, I may relate the following :---

A. B., aged about 25; several years in China. Has suffered for several years past with more or less constant diarrhea. Has lost a great deal of flesh, and never knows what it is to feel comfortable in the abdominal region. The slightest irregularity of diet, etc., brought on a sharp exacerbation of the diarrhœa and flatulent pain. Evacuations frothy, pale coloured, and bad smelling; never formed; worse in the mornings. Mouth tender. On examination, nothing special to be made out in abdominal region except diminished liver dulness and an irregular percussion note over bowel. Tongue and mucous membrane of mouth generally clean, but raw and irritable looking. Had been under treatment in other ports in China, and also at home, where he had gone on account of his health. Has at last come to look on his case as incurable, and to be endured, if possible. Has an anxious, wasted look. He was put on treatment, and after the first series of six powders of santonine felt and considered himself to be perfectly well; was passing natural, healthy, formed motions; had absolute freedom from pain and flatulence, and gaining weight rapidly. Over a year has now passed, and the patient has continued well.

It is interesting to note that I had had the patient under treatment some time before he went home, and had failed to do him any good. When I became convinced of the power of santonine in these cases I again took charge of him, with the result recorded above.

I shall let another patient describe his condition in his own words. He writes me :---

" My present trouble began about four years ago, I think, and

for the last two years was accompanied by dyspepsia in a most aggravated form; pretty well everything was tried but all to no purpose. The last two years I have been gradually losing weight, and got down from a normal weight, six years ago, of about 164 lb. to 130 lb. in thick clothes. My appetite was always good, but I had often faint feelings, headaches, and vomiting, and constant looseness, often absolute diarrhœa; at times, regular constipation for a day, always followed by greater looseness. I was often screwed up with wind collected inside, and digestion so impaired that my stools smelled so badly that I was positively offensive to myself. During all this I was in a continued state of depression and irritability. The rest you know. My weight on 18th June was 161 lb., and still 'excelsior,' I think." June 18th was only four weeks after he had taken the course of santonine—an increase of 31 lb. A year afterwards I saw the patient in perfect health.

This patient had had for treatment six powders of santonine, and nothing else. I will not multiply cases, seeing that one case is, with small differences, exactly like another. I have treated, however, since my return home one patient whom I met in a hotel in London, whose case is a specially interesting one, for, among other things, it had been diagnosed as a true example of the disease in question by good men both in India and at home. It is also most interesting from the intelligent account given by the patient of its origin, and as being just the case where, had an irritable, defenceless condition of the mucous membrane from mouth to anus existed for nineteen years, one would not have been surprised had it ended in atrophy, and the patient been incurable.

Patient states :—" I first contracted what we call in India hill diarrhœa in 1871, marching from Nini Tal to Almora. It was a three days' march, and, although in the Himalaya range, was very hot. I drank copiously from the small springs on the sides of the hill. On reaching Almora diarrhœa set in violently, and continued for a long time after I went to the plains. It was partially stopped by a medicine, but not, however, cured ; and I was never, I may say, certain of myself, and, as far as I can recollect, never had a firm motion. In 1878 I had a very bad attack in Paris, and was again helped by treatment. My last bad attack was at Darjeeling, in 1883, and up to date I have never been free from it. In 1883 I weighed 17 st. 12 lb., and went gradually down to under 12 st. I am now 12 st. 3 lb. with clothes and a light overcoat, which is scarcely enough for a man of 6 ft. 4 in."

This patient presented the appearance of chronic ill-health; pale, anæmic; pained, anxious face; and being of commanding height, his thinness was most pronounced. He complained of constant pain with diarrhœa, or rather a constant uneasy feeling in the bowel and irregular motions, ever and again lighting up into a sharp attack of diarrhœa, leaving him prostrate.

In October 1889 I put him through a course of six powders of

santonine, but he could only obtain the white, and he wrote me on the 19th of that month as follows :- "I certainly think I have benefited by the course, but possibly my complaint is of such long standing, that only six powders may not be sufficient." He was advised to obtain the yellow santonine, and repeat the course; and on the 16th March of this year he writes me :--- " Dear Dr Begg, I am afraid from my long silence you will think I have forgotten you, but that is not the case, as I waited to give the treatment you recommended a good long test before communicating the result. I went through a second course of the santonine (the vellow), and I am delighted to be able to tell you that I have been, I may say, quite free from that complaint ever since, and have felt as I have not done for years." Confirming that letter he writes on the 23rd-" I only wish I could help you to make it well known, as after years of suffering and consulting some of the best physicians in London, who gave me no permanent relief, your treatment has, as far as I can now speak, completely cured me. In addition to the relief and freedom from pain, I am quite a different man, and able to go through a hard day's work without feeling fatigue, which I was not able or fit to do before. I for one can say that the old remedies of chalk mixture, acids, milk diet, etc., are of no use for sprue, or what I call hill diarrhœa-for I have tried them all, and many other medicines that have from time to time been given me."

The description of the treatment of one case will do for all. I try, if possible, to place the patient at perfect rest in bed or on couch, and according to the percussion note on abdomen commence the treatment with or without a dose of castor-oil, guarded with tincture of opium. I also frequently order large warm water enemata at bedtime. A hot fomentation is often necessary in cases of painful flatulent distension, and generally takes the place of the usual drugs given for the relief of that condition. The diet is principally milk, pure or mixed with lime-water, eggs, and brandy, beef-tea thickened with corn-flour, weak tea with lots of milk, dry toast or soda biscuit. It is important to take the nourishment frequently in small quantities.

The dose of santonine is the usual one of 5 grains for an adult, and is given in a teaspoonful of olive-oil, well mixed, and given the first thing in the morning; or if the patient suffers considerably from the effects of the drug, I prefer to give it at bedtime. I consider it most important to give it in the oil. I give one dose each day for six days. I use the yellow crystals, having had unsatisfactory result from the white. I am aware that the colour is said to depend only on the action of sunlight, but it is a fact that sunlight will no longer act on the drug as at present supplied to us, and my last case was a marked example of the failure of the white and success of the yellow. I record my prejudice in favour of the yellow, but must leave to others the solution of the question. In the therapeutics of santonine little mention is made of any

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other property than its parasiticide action on entozoa. I have found it to exert a powerful astringent power, and prove itself an excellent constipating agent. But I am certain that we cannot attribute the good resulting to this property of the drug, nor can the diet take the credit, for I allow great latitude as soon as the six days' course is over, bringing my patients rapidly through the stages of digestible food up to the ordinary mixed diet.

Since first becoming convinced that there was a possibility of attempting the cure of these patients, I have communicated with not a few men in practice with opportunities of seeing this class of patient; and I understand good results have also been got with carbolic acid and perchloride of mercury. So far I have not had necessity to desert santonine.

In conclusion, I would shortly state my position as follows :----I do not believe that the disease sprue, as defined at the beginning of this paper, exists. I believe we are dealing with an alteration in the products of digestion induced by the agency of an organism, and that by its action the contents of the bowel are rendered unfit for absorption, and all clinical phenomena are but the result. The organism, no doubt, may produce irritation of the mucous membrane by its presence, and by the changed character of the motions. The diarrhœa is simply Nature getting rid of what she cannot utilize. The state of the mouth and general condition of the patient are simply the to-be-expected result of such interference with so important a function, and in detail are but what is seen every day in patients suffering from other diseases including or causing similar functional derangements. I believe santonine inimical to the life of the organism, although other drugs may be found to have the same power.

Dr Dods congratulated Dr Begg on his interesting paper. Every one who had practised in the tropics knew what an intractable complaint chronic diarrhœa was. He had always looked upon it as a disease resulting from the effects of malaria, and connected with the altered state of the blood found in the anæmia of the malarial cachexia. He believed that there was also some change in the constitution of the bile; and although the motions seemed free from bile, yet bile might be there, although not recognised from an absence of colouring matter. As to the presence of microbes as a cause of "sprue," he thought that that fact required some further proof, and it was quite possible that santonine acted in some other way than as a germicide. But in whatever way it acts, they must congratulate Dr Begg on having found a remedy for the chronic diarrhœa of the tropics.

Dr Begg in reply said, with regard to the identity of sprue with hill diarrhea of India, he had read Sir Joseph Fayrer's book, and it seemed to give a decided opinion on the point. His experience had been that the disease, as they saw it in North

China, was quite severe enough; and after consulting every available record of it in other places, he could not but believe that he had been dealing with examples of the same disease; but be that as it may, he would point to his last case treated in this country, an undoubted example of hill diarrhœa, a case of failure of all treatment, and a severe case of long standing, and at the same time, he was glad to say, a case giving the most marked results after the course of treatment with santonine. He could not lay too great stress on the details of the treatment. He considered it essential, first, to prepare the patient by clearing out the intestinal canal—he never gave his santonine till he got a clear percussion note on bowel; secondly, he considered it necessary to dissolve the drug in olive oil; and, thirdly, clinical experience had made him insist on the patient obtaining the yellow crystals. He had had unsatisfactory results from the white. He had to thank the Society for their cordial reception of his paper.

Meeting X.-May 7, 1890.

Professor A. R. SIMPSON, President, in the Chair.

I. ELECTION OF ORDINARY MEMBER.

II. EXHIBITION OF PATIENTS.

1. Prof. Chiene showed—(a.) A case of OLD DISLOCATION OF THE HIP-JOINT INTO THE SCIATIC NOTCH. Patient was a young man, æt. 23, and met with the injury in April 1889. On December 4, 1889, after his admission to the Infirmary, reduction under chloroform was attempted. When this failed, an incision was made and adhesions cleared away. The acetabulum was, however, found filled up, rendering reduction impossible. On January 8, 1890, the head of the femur was removed, and extension applied until there was practically no shortening. After January 17 progress was slow and the patient was much troubled with pain down the sciatic nerve. On the 21st passive movement was begun, and the power of voluntary movement was gradually regained. He was discharged on March 25. (b.) A man, æt. 42, who had suffered from BRAIN COMPRESSION, the result of injury, which occurred on February 1, 1890. He was admitted on February 6, with twitchings on the left side of the face, and a spastic condition of the arms, especially the left. Trephining was performed on the 10th, after which the twitchings diminished, and none were observed after the 18th. The opening was made over the junction of the middle and lower thirds of the fissure of Rolando on the right side. The dura mater was opened, and about half an ounce of clotted blood escaped. The case was one of laceration of the brain substance, slight at first, but increased by the continuance of the hæmorrhage. He was dismissed on March 13, cured.

2. Mr A. G. Miller showed a child who had suffered from DISLOCATION OF THE HIP, caused by disease, and gave the following description :--

M. B., a girl æt. 12, from Linlithgow, was admitted to my wards on the 25th September 1889. The history given was that she had pulled the shafts of a cart over on her the day before. She complained of pain in the right hip and knee. She presented the appearances, most typically, of dislocation of the right hip on to the dorsum ilii. There were no evidences of any recent injury, but the girl was remarkably hysterical, and had evidently got a severe fright. As I was absent from town, Mr Caird examined the girl, and came to the conclusion that the dislocation was not recent, and was probably due to disease of the joint. In a few days the patient was able to get up and to walk a little, with the toes of the right foot touching the ground. It was then ascertained that she had received an injury, supposed to have been a fall on the knee, more than a year before, and had been lame and unable to put the whole foot to the ground ever since.

When I resumed the charge of my wards, a few days after the patient's admission, I found the girl able to go about, but very lame, and with well-marked signs of dislocation of the right hip on the dorsum ilii. The previous history being very uncertain, as obtained from the child herself and also from the friends through the doctor in the country, I was uncertain as to whether there had been disease antecedent to the first injury. As to the dislocation being of old standing I had no doubt. With the consent of the parents I decided to cut down on the head of the femur, remove it if it was diseased, return it to the acetabulum if possible if it was healthy, and in either case to do my best to obtain a straight limb for my patient. Accordingly, on the 25th October, one month after the patient's admission, assisted by Mr Caird, I cut down on the head of the femur where it lay on the dorsum of the ilium. We found no evidence whatever of recent injury. The neck of the femur was surrounded by dense muscular and fibrous adhesions. When these were cut through with some difficulty, we found the head of the femur apparently perfectly healthy, but without a scrap of ligamentum teres attached to it. On examining the acetabulum it was felt to be filled with what we took to be granulation tissue. It was not scraped. This, I now think, was a mistake. With a little gentle manipulation the head of the femur slipped into the acetabulum. The girl's legs were then brought together and seen to be of the same length. The wound was irrigated, and stitched up with a rubber drainage-tube at the most dependent part, and continuous extension applied to the limb.

Most unfortunately the wound suppurated. The child did fairly well, except that a sinus remained where the drainage-tube had been placed. This sinus was found two months after the operation to lead to carious bone. The old incision was therefore opened up on 26th December, and the head of the femur removed in a carious condition. By the 27th March 1890 the wound was quite healed, the patient wearing a Thomas's hip-splint when up. On careful measurement the right leg is found to be half an inch shorter than the left, and the trochanter half an inch higher up and slightly more anterior on the right than on the left side. The natal fold is well marked on both sides. The right limb is almost as well nourished as the left. There is some power of movement of the right hip.

Remarks.—1. From the condition of matters found at the operation, the absence of all signs of recent injury, and the dense adhesions that existed, amounting to a new capsule for the head of the femur, I am certain that the dislocation was of old standing, and had occurred probably at the time of the first injury, more than a year before admission. This is confirmed by the statement of the parents, that the girl had walked on the toes of the right foot ever since that time.

2. From the absence of all trace of the ligamentum teres, the presence of granulation tissue in the acetabulum, and the immediate occurrence of carious disease in the head of the femur on its return to the acetabulum, I consider that disease of the hip-joint (acetabulum) preceded the dislocation, and tended to make the production of this injury, which is so uncommon in children, more easy. I was prepared to find this result, for Dr Henry Alexis Thomson had drawn my attention to the cases published by König, who says :--- "Dislocation in tubercular disease of the hip usually depends on osseous coxitis, especially of the acetabulum. It occurs under slight injury, and the femoral head travels in the same directions as in traumatic dislocations. A blow on the knee, or the weight of the bed-clothes. may be sufficient. In most of my cases the acetabulum had become partly filled up with tubercular granulations. The ligamentum teres is always destroyed" (from notes by Dr H. A. T.) König's treatment of such cases is to excise the head of the femur, even though it may seem to be quite healthy. He has published three cases similar to mine, in two of which the head of the femur seemed to be healthy, and in all the acetabulum was diseased.

III. EXHIBITION OF SPECIMENS.

1. Prof. Chiene showed — (a.) A TUMOUR removed supra-

pubically, on January 29, 1890, from the anterior wall of the bladder of a man, aged 28. The wound healed slowly, and the patient was dismissed cured on March 20. (b.) Three URINARY CALCULI and MIDDLE LOBE OF PROSTATE, removed supra-pubically from a man aged 72, on February 24, 1890. Healing went on favourably, and the patient was dismissed cured on 31st March. (c.) Schall's CHLORIDE OF SILVER BATTERY, for use with the cystoscope.

2. Dr John Duncan showed the HEAD OF THE FEMUR, removed from a case of spontaneous dislocation of the hip two or three years ago.

IV. ORIGINAL COMMUNICATIONS.

1. NOTE ON LAMENESS AFTER HIP-JOINT DISEASE.

By JOHN CHIENE, F.R.C.S. Ed., Professor of Surgery in the University of Edinburgh.

In bringing before you to-night for your consideration a few aspects of the progress of subacute cases of hip-joint disease, in which the patient is walking about during the course of the disease, I have no wish to discuss the general question of lameness after hip-joint disease.

As we are all aware, when the hip-joint becomes diseased, certain changes take place with regard to the relative position of the limb with the body. At first we have rotation outwards with abduction of the limb, followed at a subsequent date by rotation inwards with adduction of the limb. This is accompanied by a twisting in the lumbar region of the spine-forwards in rotation outwards at the hip. backwards in rotation inwards at the hip. The patient does this in order to retain the parallelism of the two limbs necessary for stable equilibrium. The normal sequence of events then is as follows :- The tension in the joint due to effusion causes patient gradually to relax his ileo-femoral band. This he does by flexing the thigh on the abdomen and abducting the limb. At the same time he relaxes the ilio-psoas muscle by rotating the whole limb outward. The irritation in the joint helps to cause these movements on account of the nervous sympathy which exists be-tween the joint and the muscles surrounding it. If patient wants to walk about with the leg in this position he must droop the pelvis towards the affected side in order that the foot may reach the ground, and at the same time rotate it forwards to bring the affected limb parallel with the other. This is what actually happens. As the disease advances the limb slowly assumes the position seen in backward dislocation of the head of the femur. The posterior part of the capsule is stretched, and the thigh being flexed, the head of the bone passes backwards, there is inward

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rotation of the limb, the knee-joint passes inwards, and now to maintain equilibrium patient must rotate his pelvis backwards, thus bringing the affected limb in a measure parallel with its fellow.

Thus, in the ordinary run of cases, rotation of the limb plus compensatory rotation of the spine plays the principal part in the movements. But in the cases which I wish to bring before you the rotation was a minor factor. The reason of this I am unable to explain. I must simply deal with the cases as I found them.

The first case is that of a little girl, illustrating flexion. J. C., four and a half years old. She had suffered from lameness for two There was anchylosis of the right hip in the flexed vears. position: rotation almost altogether absent; no pain. When laid upon her back on a hard mattress it was found that the thigh was flexed on the abdomen at an angle of 110°. When standing erect, which she did with the aid of crutches, the right foot was raised six and three-quarter inches from the ground. On being told to bring the foot to the ground, by means of a rotation of the pelvis she diminished the distance to four and a half inches. Still further urged, she touched the ground with her toes, the heel being elevated two and a half inches, but this was done by a peculiar power she possessed of dorsiflexing the left knee, and by still further rotating the pelvis. Lastly, being persuaded to undo the abnormal position of the left knee she stood with both feet on the ground, both knees bent, and the pelvis rotated forwards, producing a deep anterior curvature in the lumbar region. There was also a drooping of the pelvis of 8° from the horizontal towards the affected side. Conclusion-flexion with little or no rotation.

Second Case.-J. G., a boy, eighteen years of age, illustrating abduction. The diagnosis in this case was doubtful. It may possibly have been rheumatic. He had been suffering for six months from sciatic pains in the right leg, and now complained of that leg being longer than the other. He throws out the right leg in walking. The position he took up was that of the first stage of hip-joint disease, but he had no pain on pressure over the trochanters, and could stand on either leg without pain. He could walk a distance of three miles without any discomfort. His greatest trouble was in going upstairs. When standing with the feet together, the right knee is considerably flexed and the pelvis droops towards that side. On being asked to straighten the affected limb he did so, at the same time raising the opposite foot off the ground. In order to bring the pelvis to a horizontal position the affected limb had to be abducted, and it was then found to be four and a half inches from the ground, thus doing away with the apparent lengthening. The conclusion come to was that the hip was anchylosed in the abducted position at an angle of 114°.

Third Case.—I. T., a boy of sixteen, illustrating adduction. Had suffered from pain in his left hip-joint about two years ago.

This case, occurring as it did shortly after the one just mentioned. seemed to be one of exactly similar nature. Patient when standing assumed the position of the first stage of hip-joint disease on the right side. He can walk considerable distances without discomfort; never failed to bring down the heel. Has a great limp. As in the last case, his chief difficulty is in getting upstairs. analysis of the case the following facts were observed :---When standing with the left foot firm on the ground the right knee is bent, and the pelvis droops towards the right side at an angle of 11° with the horizontal. On straightening the right leg the left is raised from the ground, and the same droop of the pelvis is maintained. In order to bring the pelvis horizontal the left leg has to be crossed over the right, and is then one and threeeighth inches from the ground. When lying in bed patient lies with his legs crossed. Conclusion-Anchylosis of the left hipjoint in the adducted position at an angle of 69°.

In measuring the angle between the pelvis and thigh I have been greatly assisted by an instrument lent me by Mr Duncan. This instrument, however, has the disadvantage of being difficult to use in such a case as the first, namely, that of flexion.

Mr Russell, a clerk in my wards, has introduced a method of estimating the obliquity of the pelvis in the erect position, which is also of value. There is great difficulty in estimating the obliquity when patient is lying. When standing, Mr Russell's instrument, on the principle of a spirit-level, is of great use.

Dr John Duncan said the instrument to which Mr Chiene had referred was constructed by one of his clerks, Mr Galley, as an improvement on the three pieces of wood which he was formerly in the habit of using. It fulfilled its purpose well. Mr Chiene's cases were interesting examples of departure from the typical deformities of hip-joint disease. All these deformities of diseased strumous joints were primarily due to muscular effort, voluntary or involuntary, to maintain the part at rest. The special posture of each joint was involuntarily determined by the balance of forces, and the extreme degrees were brought about by the fact that the tissues, which happened to be stretched, gradually elongated, and the balance had to be ever continuously readjusted in consequence thereof. When voluntary muscular effort came in it produced modifications, of which, as it appeared to him, Mr Chiene's cases were striking examples of great rarity, arising no doubt from the fact that the patients, having early discovered, had persistently maintained a position of ease not in accordance with preponderating muscular mass.

Mr Cathcart believed that the deformity in cases of hip-joint disease was at first produced by muscular spasm reflexly excited by the disease. The reflex effects might be prominent, while the disease causing them might be in itself inappreciable; just as

prominent bladder symptoms in children might be caused by an adherent prepuce which otherwise gave no trouble, or as fits might result from rectal thread worms. Tubercular disease, as for instance in the vertebral column, might go on so insidiously that angular deformity, accidentally noticed, might be the first and for long the only symptom. Hence he would be slow to exclude real disease in these cases of Prof. Chiene. He had often seen children brought into the surgical waiting-room, not for pain in either hip or knee, but for deformity, which really hip-joint disease had produced. He believed that there was a physiological association between joint nerves and joint muscles, and that the joint deformity was partly at least due to the particular joint nerves involved in the disease.

Dr Hughes, in explanation of the deformity in the second of Prof. Chiene's cases, in which there was simple abduction, begged to suggest that it was probably a case in which resolution had occurred at the end of the first stage of hip disease. During the first stage there was abduction and eversion, the eversion being probably due in part to the contraction of the ilio-psoas, and the external rotator muscles which lay in close contact with the capsule of the joint and were probably irritated. Dr Hughes suggested that the rotator muscles probably became tired out and exhausted at the end of the first stage of the disease, and that anchylosis had set in before the limb had changed from the abducted into the adducted position, as usually occurred during the second stage of hip disease. As to the third case, Dr Hughes thought that the rigidity of the lumbar spine in this patient, who was 18 years of age, might account for the want of rotation,-as in a younger patient, in whom the spine was not so rigid, rotation would probably occur. Dr Hughes thought that in using the instrument shown by Prof. Chiene for determining the obliquity of the pelvis there might be some difficulty in steadying the spirit level, as it was placed in contact with two movable bodies,-viz., surgeon and patient, and that some modification of Mr Barwell's scoliosis gauge, with a horizontal bar movable on an upright, which was fixed to a pedestal, would serve equally well, and be more easily applied.

2. THE TREATMENT OF FLAT-FOOT.

By A. G. MILLER, F.R.C.S. Ed., Lecturer on Clinical Surgery, and Surgeon to the Royal Infirmary, Edinburgh.

MR PRESIDENT AND GENTLEMEN,—The subject of flat-foot has acquired some prominence within the last ten years from the writings of Von Meyer, of Ogston, and of many orthopædic surgeons, both in England and America. To Symington we owe what is apparently the only account of the anatomical features of the

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deformity. Recently many papers and letters have appeared in the medical journals, which demonstrate that there are many different views held as to the treatment of flat-foot, and even as to its nature. I do not profess to be able to lay before you anything new or original, but I hope by my statement or demonstration to simplify the pathology and treatment of *pes planus*. If in so doing I have to go through some elementary and familiar details, I trust you will excuse and bear with me.

For my present purpose I will define flat-foot as simply the giving way of the arch of the foot. The inner and more important portion of this arch is composed of the os calcis, the astragalus, the scaphoid, the internal cuneiform, and the metatarsal bone of the great toe. All these are firmly united to one another, in a continuous sequence, by strong ligaments, except the astragalus, which has loose and movable connexions with the os calcis and scaphoid (more especially the latter), between which it is This comparatively loose connexion is necessary to situated. permit the various lateral movements of the foot to take place at what may be called in general terms, the ankle. The astragalus being pretty firmly wedged between the two malleoli, the rest of the tarsal bones, in lateral movements (pronation and supination) move upon it. In order to atone for this looseness of attachment of the astragalus, there are specially strong connexions between the os calcis and the scaphoid, so as to maintain the solidity of the arch of the foot. This is all the more necessary seeing the astragalus is, as it were, the keystone of the arch; and as the weight of the body is transmitted to the foot through it, it might, in its peculiar position, act as a wedge to break up the arch of the foot instead of strengthening it.¹

To support the astragalus on the inner side we find—(1), the sustentaculum tali, a projection from the inner side of the os calcis; and (2), a strong ligament, the *inferior calcaneo-scaphoid*. This important ligament passes from the sustentaculum tali to the under surface of the scaphoid, thus filling up what would otherwise be a gap of quite half an inch in extent. The head of the astragalus, covered with articular cartilage, lies on, but is not attached to it, a synovial membrane intervening. In fact, this ligament forms part of the capsule of the ball-and-socket joint which exists between the astragalus and scaphoid. On this ligament evidently the main strain falls when the astragalus is pressed downwards by the weight of the body (vide previous note). Of course a part is taken in maintaining the solidity of the foot by all the tarsal ligaments more or less, and support is also given

¹ Symington (Journal of Anat. and Phys., October 1884) has shown that an action of this kind does occur normally. He says (quoting von Meyer), "When the sole of the foot is placed upon the ground, and pressure exerted upon the astragalus from above, its body glides forward upon the os calcis, while the head of the bone sinks downwards and inwards."

by the various muscles whose tendons pass to the sole of the foot, especially the *tibialis posticus* and the *flexor longus pollicis*. The tendon of the former is in contact with the calcaneo-scaphoid ligament, and that of the latter passes forwards under the sustentaculum tali.

Now, if the arch of the foot is dependent on this calcaneoscaphoid ligament, and if flat-foot is a giving way of the arch of the foot, any undue straining of this ligament may produce flatfoot; and this is done in the way that I have already indicated, viz., by the astragalus forcing asunder the os calcis and scaphoid, and so stretching the calcaneo-scaphoid ligament.

If I am correct, then the treatment of flat-foot is reduced to perfect simplicity. We have to relieve the strain on the calcancoscaphoid ligament.

Of course there is nothing new in this view. It is sometimes called the old view. To overthrow it von Meyer, about ten years ago, declared that in flat-foot this ligament is not elongated, and that the inner border of the foot is not increased in length. He came to this conclusion by comparing normal with flat feet in living subjects. But Symington tells us, from a comparison of dissected feet, that in a case of flat-foot the length of the ligament was as 35 mm. to 22 mm., and 19 mm. in two normal feet. Besides, he says, "independent of measurements, the general increase in size of the ligament is quite apparent."

In support of this view let me remind you that in flat-foot pain is experienced in three situations—(a), on the inner and inferior aspect of the foot; (b), across the dorsum; and (c), on the outer side.

In the first situation the pain, which is always an early and prominent symptom, is elicited by pressure just behind and below the tubercle of the seaphoid, which is the position of the inferior caleaneo-scaphoid ligament. Symington has told us that in the specimen of flat-foot which he dissected (an aggravated case), "the cartilage covering the surfaces that articulate with the scaphoid and sustentaculum tali were normal, but that connected with the inferior calcaneo-scaphoid ligament was thickened, softened, and in a few places it was completely destroyed, and the subjacent bone was in a condition of porosis." This condition he attributes to "irritation resulting from pressure against the ground." I would be inclined rather to attribute it to contact with an inflamed structure, viz., the calcanco-scaphoid ligament. Symington does not mention whether that ligament showed signs of inflammation or not. But in the early stages of flat-foot the bone and cartilage cannot have suffered from contact with the ground, the pain is distinctly referable to the calcaneo-scaphoid ligament, and stretching is most likely to be the irritant.

The pain in the second situation (viz., across the dorsum of the foot), which is a somewhat later symptom, is due evidently to the pressure of the astragalus against the scaphoid after the normal relation of these bones has become somewhat altered. Symington says that this abnormal pressure may actually wear away part of the upper surface of the scaphoid.

In the third situation the pain is certainly due to pressure of the external malleolus on the os calcis. This is the result of rotation of the os calcis, and occurs in advanced cases. It is therefore a late symptom and a proof of aggravated flat-foot. Symington has demonstrated that at first articular facets form on the os calcis from the pressure of the fibula, but that inflammation and softening of the bone may take place later on.

In further support of this view of the pathology of flat-foot let me remind you that those who suffer from the deformity are those who have to stand much or to carry burdens. In such there is an undue pressure downwards on the arch of the foot. Again, in those who have a tendency to flattening of one foot only, it is the one on which they habitually stand that is affected. Ill-fed, growing children, also, whose muscles are deficient in power and tone, frequently are sufferers, because the additional support to the ligaments is awanting which ought to be given by the muscles.

How, then, can we take the strain off the calcaneo-scaphoid ligament? Of course making the patient avoid the upright position will do this. But those suffering from flat-foot seldom can or will lay up. It is necessary, therefore, that they should be instructed in some method of standing and walking that will take the strain off the inner side of the foot. This is most easily done by a simple method which I find was published in my father's Practice of Surgery in 1846. It is possibly much older, though recently claimed by an English surgeon as his own invention. It consists in making the sole of the patient's boot thicker on the inner than on the outer side, and in this way throwing the weight of the body more on the outer side of the foot. The modus operandi of this simple plan is easily seen on the skeleton, and it is indeed wonderful how very slight an inclination of the foot throws the line of gravity over to the inner or outer side. Many persons suffering from commencing flat-foot naturally adopt this method, and habitually stand on the outer side of the foot.

It has been demonstrated by von Meyer and Symington that in the normal foot the centre of the astragalus is outside a line drawn from the heel to the ball of the great toe, and inside that line in flat-foot.¹ Any one, however, can move von Meyer's line to the outer or inner side of the centre point of the astragalus by simply pronating or supinating the foot, and it is this power that is utilized in the above treatment. The result of the elevation of the inner side of the foot (by the wedge-shaped sole) is to place the centre-

¹ In some normal feet the astragalus centre is slightly inside such a line. Symington calls this a mechanical tendency to flat-foot, and perhaps it is in such persons that the down-pressure in standing and carrying weights develops flat-foot.

point of the astragalus on the outer side of the line, or, in other words, within the triangle on which the weight of the body is normally borne. This triangle, as described by von Meyer, being the tip of the heel, the ball of the great toe, and the ball of the fifth toe.

It is easy to see that this alteration of the relation of the astragalus to the other bones of the foot relieves the inner at the expense of the outer side. It will take some strain off the calcaneoscaphoid ligament, therefore, and will also prevent the contact of the os calcis with the tip of the fibula. But can the outer side of the foot bear the extra burden? It ought to do so, for the strain is distributed among a large number of ligaments, and the bones are arranged in such a manner that the transverse arch of the foot is brought into play; besides, the outer side of the foot is in contact with the ground almost throughout its entire extent normally.

Now, the second point in the treatment is support. How is support to be got for the calcaneo-scaphoid ligament? Some recommend mechanical means, such as a spring or pad in the boot, and there may be cases in which this treatment is useful. But in many instances the pressure on the under surface of the arch of the foot only increases the patient's discomfort. And one can easily understand how this is, if we are right in supposing that the calcaneo-scaphoid ligament is in an irritated condition from the abnormal strain thrown upon it.

The main support of the astragalus (on its inner and under surface), we have seen, is the inferior calcaneo-scaphoid ligament; the main supporters of it, in its turn, are the posterior muscles of the leg. If they are strengthened, therefore, the ligament will be relieved, more especially in walking. To tone them up a system of gymnastics must be adopted. Flexion and extension of the ankle-joint, circumduction of the foot when raised from the ground, rising on the toes several times in succession, and also walking on the toes, are good exercises. The last is useful also in taking the strain off the arch of the foot by transmitting the weight of the body more directly from the astragalus to the scaphoid. I trust that it is not necessary for me to dwell on the importance of toning up the muscles, and, indeed, of the whole system, in such cases as those of flat-foot, in which the deformity is the result of inability on the part of one portion of the organism to fulfil its function and meet the demand made upon it under, in some instances, even normal conditions. It is quite evident that all the constituent parts of the lower extremity are dependent on one another, just as the various organs of the body are. It is equally evident that the ligaments of the foot are very dependent on the muscles of the leg, and that when the latter are deficient in their duty there is extra strain put on the former.

I have devoted a considerable portion of this paper to a demonstration of how a slight mechanical alteration of the relation of the foot to the astragalus will benefit flat-footed persons. But I think that on the whole, especially in incipient cases, more ultimate good will be derived from devoting attention to the strengthening of the muscles of the leg and foot. Massage and such exercises as those I have indicated will be found very useful towards this end.

I have not dealt with the subject of diagnosis specially, having already published my opinions on this point in a clinical lecture which appeared in the *Edinburgh Medical Journal* for November 1889. Mr Ellis of Gloucester has honoured me by referring to that lecture in a paper contributed to the *Edinburgh Medical Journal* for January 1890. I find that he and I are agreed as to the importance of the muscles of the leg in the proper treatment of flat-foot, and also as to the way in which they ought to be trained and strengthened. Mr Ellis, however, does not approve of the method of throwing the weight of the body on to the outer side to save the inner side of the foot.

I will not attempt to deal at present with the question of what operation should be performed in aggravated cases of *pes planus*. Patients do not generally elect to undergo operations for mere deformities; but they are often willing to submit to anything for the relief of pain. Now, the pain in flat-foot ought to be relieved by the treatment to which I have referred. The supinated position of the foot and the strengthening of the muscles of the leg will take the strain off the calcaneo-scaphoid ligament, will prevent the contact of the os calcis with the fibula, and ought in time to restore the astragalus to its normal relation to the scaphoid. In very aggravated cases one might commence treatment by confining the patient to bed for a short time, during which massage might be employed. I have not yet performed any cutting operation for this affection. I will, therefore, wait till I have failed with the above treatment before I decide what special operation I will adopt.

Professor Chiene congratulated Mr Miller on the paper which he had just read. He believed that with regard to the anatomy of the arch of the foot, the tibialis anticus and peroneus longus muscles were also stretched. A figure-of-8 elastic bandage attained the object which Mr Miller desired, namely, to elevate the inner edge of the foot. In painful cases Mr Chiene had found great assistance from a rigid arch, which gave rest to the tarsal joints, and relieved the irritation at the inferior calcaneo-scaphoid ligament, in the same way that relief was given in painful cases of disease of the first metatarso-phalangeal joint by a rigid piece of metal placed between the layers of leather in the sole of the boot.

Dr Hughes remarked that there was one statement made by Mr Miller with which he could not agree, viz., that the weight of the body was transmitted from the tibia through the astragalus to the calcaneo-scaphoid ligament, which was thus very apt to give way. In the normal position of the foot with the toes pointing
forwards, the weight was transmitted from the astragalus mainly to the os calcis and thus to the ground, and that the greater part of the weight of the body was borne by the outer part of the foot, os calcis, and cuboid, while the inner segment of the arch formed by the sustentaculum tali, scaphoid, and calcaneo-scaphoid ligament were concerned in affording elasticity to the foot rather than giving support. If however, the toes and the anterior segment of the foot were turned outwards, then the relations of the astragalus to Meyer's line and of the tibia to the plantar arch were so altered as to direct the weight on to the arch instead of the os calcis. This probably explained the frequency of flatfoot in soldiers, and accounted for the great difficulty experienced during long marches due to foot-soreness, as in the military position of attention and during marching the toes are turned outwards. As to the boots mentioned by Mr Miller, Dr Hughes stated that, from personal experience of a large number of cases in Mr Thomas's practice, he could speak highly of the efficacy of the wedge-shaped sole, by which the weight of the body is thrown towards the outer side of the foot, and the structures on the inner side being thus relieved from pressure, in painful incipient cases the relief afforded, he stated, was very marked. Dr Hughes thought that some provision should be made for the support of the transverse arch of the foot, which also gave way, due, probably, to a weakening of the peroneus longus which occurred in the early stages, and to afford this support the inner sole and welt should be convex from side to side instead of being concave as usually worn.

Dr James Ritchie thanked Mr Miller for his lucid exposition of the mechanism of the production of flat-foot, an affection interesting to the physician as well as to the surgeon. He agreed with Mr Miller that as a curative agency muscular exercises were of most importance. With these he conjoined local stimulation-friction and daily bathing with cool salt water. Although some patients could not wear the pad, others found it very beneficial. The speaker used with it a thin arched metal plate (not so long as to interfere with the metatarso-phalangeal joint of great toe) in order to prevent the thin-soled boots of ladies from being distorted by the pad. He cautioned his patients against much standing. He agreed with what Dr Cotterill had said regarding hallux rigidus; the first stage in its production was a measure of flat-foot, and he found it to be much benefited, specially in the early stages, by tip-toe exercises regularly performed.

Mr Miller, in reply, said that there were many important points in connexion with flat-foot on which he had not touched in his paper, because he wished to concentrate attention on the calcaneoscaphoid ligament. He knew that there were many other structures to blame, especially the muscles, for the production of flatfoot, but, at the same time, he believed that the calcaneo-scaphoid ligament was the key of the position. He considered that when the important part played by that ligament was borne in view, the suitable treatment would be plain. He quite agreed with much that had been said in the discussion, especially as to the importance of the peroneus longus in maintaining the transverse arch of the foot, and the great harm, on the other hand, that often resulted from improper turning out of the foot in walking. He still thought that a pad inside the boot did more harm than good in many cases, and was strongly of opinion that exercising the muscles of the leg, especially in incipient cases, was the most useful method of treatment. Mr Miller, in conclusion, thanked the Society for the kind manner in which they had received his paper.

Meeting XI.-June 4, 1890.

Professor A. R. SIMPSON, President, in the Chair.

I. EXHIBITION OF PATIENTS.

1. Mr George A. Berry showed A MAN, J. B., aged 21, from whose left orbit he removed the end of the stem of a clay pipe, $1\frac{3}{4}$ inch in length by $\frac{1}{3}$ inch in thickness. The patient when first seen had considerable protrusion of the eye with cedema of the lids and conjunctiva. The portion of pipe lay about 1 inch from the surface, and although it had been in the orbit for ten days had not produced suppuration. The eye was uninjured.

2. Mr A. G. Miller showed a successful case of LAPAROTOMY in a girl, aged 10, for tubercular peritonitis. The following report of the case was drawn up by Dr D. A. Carruthers, house-surgeon :—

M. F., æt. 10 years, residing at Broxburn. Admitted to Ward XVII. on 10th February 1890, complaining of weakness, and pain and swelling in the left leg.

History.—On the 22nd January, three weeks previous, patient suffered from great pain in the abdomen, vomiting, and diarrhœa. These symptoms were attributed to some "dumplings" of which she had partaken the day before. The vomiting stopped the following day, the 23rd January; but the pain, though not so intense, and the diarrhœa continued. On the 29th January she began to complain of pain in her left leg. It was very painful at first, but after a time became easier, and she allowed it to become flexed at the knee.

Previous History.—Patient has always been a weakly child, and has had "runnings" from the side of the neck until quite recently.

Family History good.

Present Condition .--- On admission patient was emaciated and in a very weakly condition. There were two or three scars on the sides of the neck, one of which was quite newly formed. Her left leg was flexed at the hip and knee, and there was a slight tendency to external rotation. There was considerable swelling on the anterior aspect of the thigh, extending from the knee for a considerable distance up the limb. On palpation distinct fluctuation could be made out in the swelling. There was slight tumidity of the abdomen, and diarrhœa; the stools were chiefly fluid or semisolid.

Diagnosis.—Periostitis of the femur, with formation of an abscess, probably extra-periosteal.

Treatment.—On the 13th February Mr Miller cut down on the lower third of the thigh on the inner side, and opened into an abscess which extended upwards. He made a counter-opening about six inches above the original incision. On examining the bone with his finger, he found it was not bare. A drainage-tube was passed through from one opening to the other. Patient's temperature still continued high after the operation, and it was thought advisable to incise the periosteum; but on dressing the wounds two days after the operation, the bone was found to be bare at the lower part, and no further operation was needed. On the fourth day the tube was cut and a piece put in at each end. About ten days after the operation the lower tube was removed, and shortly after the upper. The lower wound healed in about three weeks, but the upper wound did not heal until the end of March. The diarrhœa from which the patient suffered on admission continued unchecked after the operation on the 13th February, and resisted treatment by large quantities of lime water, etc. On the 18th February an enema was ordered daily, in order to clean out the lower part of the intestine and remove any fæcal accumulation there. This checked the diarrhea, and reduced the motions from four or five to two a day. The temperature began to come down and continue steady. The tumidity of the abdomen increased markedly towards the end of February, and the presence of fluid in the abdominal cavity could be easily made out. Examination by the rectum gave no cause for the diarrhea, but showed protrusion downwards of the pouch of Douglas, as if filled with fluid. From these symptoms, together with the previous history, tubercular peritonitis was diagnosed, and permission was asked from the patient's friends to perform laparotomy.

On the 9th March there was considerable redness at the umbilicus, and protrusion of a part of the wall, which was reddened and about the size of a hazel nut. Fearing rupture through the protrusion, Mr Miller, on the 10th March, incised the swelling and allowed 18 ounces of thick greenish pus to come away. A large quantity of wood wool was put on; the dressing had to be changed twice during the night. On the following day the diseharge was much less, and so little that in the afternoon a Friars' balsam dressing was applied, but the discharge came through this in a

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large quantity on the following day. The pus was not so thick as at first, but there was still a considerable amount.

March 17.-Mr Miller having obtained the parents' consent, performed a laparotomy in order to wash out the abdominal cavity. He made an incision in the median line about 3 inches in length. between the umbilicus and the pubes, and nearer the former than the latter. He dissected down and opened into the abdominal cavity at the upper part. He found the intestines considerably matted together, but made no attempt to undo any adhesions, whether between the intestines and the walls or among the intestines. The peritoneum was much thickened, and resembled the synovial membranes in a knee-joint undergoing gelatinous degeneration. The cavity was then thoroughly washed out with warm boracic lotion. Thereafter the wound was sewn up with five After the operation there was no rise of temperature stitches. until late at night, when it went up and continued high during the following day.

March 18.—Owing to the high temperature it was thought advisable to open up the wound and put in a glass drainage-tube. Immediately on opening there was a gush of fluid—dark coloured, sanguino-purulent—about 8 ounces in amount. After the tube was put in the temperature came down and continued down.

March 21.—As the wound tended to gape, and there was free communication with abdominal cavity, the tube was taken out. The wound was filled with granulations, rather pale and flabby. As patient had had no motion of the bowels since the operation, an enema was given, which resulted in a stool in which there were some small fæcal masses.

The wound continued to granulate, and on the 25th there was a level surface, with slightly flabby granulations. There was a tendency towards cicatrization at the edges.

March 27.—In order to bring the edges of the wound together, strapping was applied.

March 29.—When dressed the wound was found to have contracted considerably, and the granulations were looking much more healthy.

The wound continued to be dressed every second or third day, and on the 29th April was reduced to a mere line, with some exuberant granulations at the upper and lower part of the wound. Strapping was applied firmly, and the granulations were touched with bluestone. Patient was allowed up in the seventh week after the operation. The wound healed, and in less than a fortnight thereafter she was sent to the Convalescent Home at Gilmerton.

Condition when Discharged.—Patient was much stouter than on admission, and more healthy looking. The wounds in the left thigh were healed, and had been for more than a month. The wound in the abdominal wall was quite healed. The diarrhœa had ceased, and patient had one natural motion of the bowels daily. There was no symptom of any fresh outbreak of tubercular disease.

II. EXHIBITION OF SPECIMENS.

1. Dr James Ritchie exhibited KIDNEYS from a female, age 48, of rheumatic constitution. She had borne ten children, for some years had been anæmic, not robust, and was liable to sudden acute attacks of pain in left lumbar region, accompanied by great prostration and sickness, occasionally preceded by a copious flow of urine. There was no history of gravel, nor of acute inflammation of kidneys. Three years ago, upon examination during one of these attacks, there was found in the left hypochondrium a nodular elongated firm mass, slightly movable. Last July during an attack there was a considerable amount of blood in the urine, this being the only occasion on which blood was observed. At this time the right kidney also was found to be enlarged, with irregular surface. For a considerable time the urine had been copious, clear, sp. gr. about 1012, with a trace of albumen, no tube casts. There was a slight systolic mitral murmur. Since July there was no severe attack, and the patient was not examined; but about a fortnight ago, after having been out of doors, she took suddenly ill, and died within two hours, with symptoms of hæmorrhage into the pons. On examination, sixteen hours after death, the bladder and ureters were found to be perfectly normal, the right kidney slightly enlarged, with its pelvis considerably enlarged and distended with urine, which could be slowly evacuated by pressure. On section, the cortical substance had a granular aspect : it was slightly diminished in thickness, and the cones were compressed, some of them lying in an oblique direction. The left kidney was slightly enlarged, nodular, the pelvis enlarged, distended with fluid, not the smallest drop of which could be squeezed out by pressure. On section, it was found that the nodules represented dilated calyces, the kidney substance was almost destroyed by pressure, not the slightest trace of former opening of ureter into the pelvis could be discovered. The pelvis and calvees contained 150 cm. of fluid. There was no trace of calculus. During life the patient presented many of the symptoms found with cystic kidney; there was no history of stone, nor of inflammation of kidneys. Dr Ritchie hoped that microscopic examination might aid in elucidating the cause. The wall of the left ventricle was an inch and a half thick, the mitral valve considerably thickened and roughened at the edges, the aorta and renal vessels much thickened with succulent atheromatous patches.

2. Dr W. Russell showed a large HYDRONEPHROTIC KIDNEY, due to the occlusion of the ureter by a large calculus still in situ.

The patient was a man, aged 31, who was under Dr Muirhead's care last January for the kidney condition. The tumour in the loin was at that time aspirated, and fluid containing urea was removed. No further operative measures were adopted, as the patient was suffering from double aortic lesion and mitral regurgitation.

3. Dr Allan Sym showed a BRAIN from a young woman, aged 22, with multiple hæmorrhages in the optic thalami. The girl had been ill for about ten days. Dr Sym was sent for on Saturday, when she was complaining of bilious vomiting. He ordered a purge, and she was much better on Sunday. On Monday, at 4 A.M., she became unconscious, with varying breathing, at times cerebral. Pupils at times contracted to light, and then again would not. Temperature never rose above 102° ; pulse variable. Dr Burn Murdoch saw her in consultation, and they agreed on cerebral disease, but what they did not know. There were at that time jerkings and stiffening of the limbs, and symptoms most peculiar. She died on Tuesday at 5 A.M. Post-mortem changes came on very rapidly. Dr Littlejohn kindly did the post-mortem examination, and in addition to the condition mentioned, they found excessive fluid in the lateral ventricles.

III. EXHIBITION OF INSTRUMENTS.

1. Mr Charles W. Cathcart read the following Note on an APPARATUS FOR STERILIZING STEEL INSTRUMENTS BY STEAM WITHOUT RUSTING THEM :---

Last summer (1889), while taking out a course of Bacteriology under Dr Woodhead, I was impressed with the use which he, as a bacteriologist, made of heat as a sterilizing agent, and also with the efficiency of steam in particular for this purpose. It then occurred to me that the sterilization of surgical instruments would be an additional protection against sepsis in wounds, especially in hospital practice. With reference to the value of steam, I may here quote the result of experiments by Koch, Gaffky, and Löffler, as given by Crookshanks in his Manual of Bacteriology, 2nd ed., page 159 :--- "Rolls of flannel with anthrax spores or earth spores, and a thermometer wrapped up inside, were subjected to steam, and the results compared with the effect obtained with hot air. Thus in hot air four hours' exposure to a temperature of 130° C.-140° C. brought the temperature inside the roll to 85° C., and the spores were not injured; on the other hand, exposure to steam under pressure at 120° C. for one and a half hours raised the internal temperature to 117° C, and killed the spores. By such experiments the superior penetrative power of steam heat was established. test steam heat at the atmospheric pressure, water was boiled in a glass flask with its neck prolonged by means of a glass tube, the

temperature in which was found to be uniform throughout. Anthrax and earth spores placed in the tube were found to be unable to withstand steam at 100° C. even for a few minutes. It was, therefore, concluded that disinfection by steam at atmospheric pressure was superior to hot air from its greater efficiency, and to steam under pressure from the simplicity of the necessary apparatus."

On inquiry I found that steam was not used for sterilizing fine steel instruments lest it should rust them, but that surgeons had already recognised the importance of sterilizing their instruments, and had used several other methods for doing so, *e.g.*—

(1.) Boiling in water and immediately drying the instruments. This I tried, but found the instruments apt to rust. This method also involves considerable expenditure of time and trouble, while the after-drying partly obviates the benefit of sterilization.

(2.) Heating for 20 minutes in a copper vessel containing glycerine or vaseline at a temperature of about 120° or 130° C. (248° or 266° F.) This is recommended by Professor Poncet of Lyons.¹ It is no doubt effectual, but requires a somewhat expensive apparatus. Moreover, careful watching to regulate the temperature would be necessary, as the boiling point of the liquids used is given at 280° C. (526° F.), a temperature which would damage the temper of steel.

(3.) Sterilizing with hot air. Dr Martin of Berlin has introduced a sterilizer, for this purpose, of double plates of galvanized iron, with a lining of asbestos between them. Apart from the inferiority of hot air to steam as a sterilizer, and of the need for constantly regulating the temperature, this apparatus requires two men to lift it, and costs about $\pounds 5$.

On the grounds of efficiency, and of economy of time, trouble, and money, therefore, it seemed well worth while to try to overcome the risk of rust in sterilizing steel instruments by steam. Working on the statement of chemists, that rust only occurs when iron or steel is exposed to moisture in the presence of carbonic acid, I began by experimenting with various absorbents of carbonic acid. Not being satisfied with my results, I applied for advice to my friend Dr J. S. Haldane of the Physiological Laboratory, Oxford, who has lately been testing the amount of carbonic acid in the atmosphere, and who had devised special methods for its absorption and estimation. In his reply he kindly gave me among others two specially valuable suggestions, by means of which I have succeeded in doing what I wanted. One was to prevent the deposit of vapour on the instruments by heating them to boiling point before the steam was allowed to reach them, and by rapidly drving them afterwards. The other was to drive out all carbonic acid from the steam by boiling for some minutes before allowing ¹ See Revue de Chirurgie, August 1889.

it to reach the instruments. A few experiments showed me the value of these suggestions.



Both of them can easily be fulfilled simultaneously by a simple piece of apparatus which a tinsmith has made at my direction. An oval tin pot (A) like a fish-kettle, and measuring 16 inches long, 9 inches broad, and 6 inches deep, is surrounded on all sides, except at the lid, by a similar larger vessel (B), 1

inch of space being left between them. The outer compartment (B) is provided with a hole (1) for filling in the water, which can be plugged by a cork; with an exit tap (2) for emptying, and with a stop-cock (3) near the top, which opens and shuts communication with A. A has a tightly fitting lid.

The instruments to be sterilized are placed in A. They may either lie on the bottom or be in glass tubes or metal boxes. The lid of A is shut down and water boiled in the outer vessel (B) by a bunsen burner or on the fire. At first the steam is allowed to escape for the double purpose of dry-heating the instruments and of driving off the carbonic acid from the water. In ten or fifteen minutes the stop-cock is opened between A and B, and the filling hole in B plugged with a cork. Steam rushes into and fills A and escapes at crevices round the lid. The instruments can in this way be steamed for as long as is required, after which the stop-cock is turned off again and the lid taken off. The steam at once escapes and the instruments are found dry and free from any trace of rust. The smaller boxes containing instruments will have some vapour condensed on the inside of their lids, and there only, because the cold air from above cools the lids first. After the lids have been wiped dry on the inside, the rest of the boxes and their contents will be found to be dry also. The instruments free in A will be quite dry.

Since surgical instruments are steeped in antiseptic lotion before being used, the possibility of contamination by exposure to the unfiltered air after sterilization may be neglected. If, however, it were desired to have instruments perfectly protected, it could be done by using plugged test tubes, or by surrounding the small boxes, or rather the junction of the lids, with cotton-wool charged with some absorbent of carbonic acid. As the interior of the box or tube cooled the entering air would be freed of organisms by the cotton-filter, and of carbonic acid by the chemical absorbent of that gas. Ordinary washing-soda or carbonate of soda,¹ powdered dry into the wool, has proved efficient in my hands hitherto, to ¹ Soda lime would probably be better. prevent rust when I wished to leave instruments undisturbed for twenty-four hours or longer after sterilization. The wool gets damped by the steam, which thus apparently dissolves up sufficient of the soda. It is right to say, however, that where the protection by the soda has been omitted rusting has not always occurred. Where I have sterilized knives in plugged test-tubes, vapour condensed on the insides of the tubes, but gradually dried off in a few hours without doing any harm, unless the steel touched the glass at a place where it was wet.

During the steaming, some vapour condenses on the inside of the lid of A in spite of its being protected by a felt cover on the outside, and sometimes the condensed water drops on to the instruments or boxes below as the lid is being taken off. It can of course be at once wiped off, but is a disadvantage. To obviate this inconvenience I have fixed to the under side of the lid a piece of lint, which catches any drops that fall. Hooks are fastened at either end of the downward projecting lip of the lid. Strings through these fasten the sheet of lint to the lid.

Half a gallon of cold water in my sterilizer takes about half an hour to come to the boil with an ordinary bunsen burner. This quantity takes about two hours to boil down after it has reached the boiling point.

2. Dr Hughes showed a SPLINT, which he stated was an extremely simple one, and intended for the treatment of talipes varus and equino-varus. It was a modification of a shoe which he had seen used in the practice of Mr Thomas of Liverpool, which consisted of a leg-piece and foot-piece, connected by an iron band extending over the heel. In this modified splint a joint was placed opposite the heel, the joint being a three-quarter ball and socket, the ball being for the purpose of fixing the joint by means of a screw running through it. The movable parts of the joint were the sockets connected with the leg and foot-pieces. The foot-piece might be fixed in any position of inversion, eversion, flexion, and extension. In applying the splint the leg-piece was bandaged to the calf, and the foot manipulated into the best possible position, the foot-piece was then adapted to it, and fixed until the patient was seen again, when the position might be further improved by loosening the screw and manipulating the foot.

Dr Wm. Taylor was glad to see a pupil of his friend Dr Thomas, and to find that he had caught some spark of his inventive genius. He was curious to know whether Dr Hughes had seen any harm result from Dr Thomas's method of using sheet-iron splints in the treatment of club-foot without padding of any kind, applying the bare iron to the bare skin. If so, that was in itself a great gain, because you could get much more direct control over the deformed part, and keep it in more exact position. The splint shown would form an important auxiliary in the treatment of club-foot, although the great thing was to treat it as a paralysis, which was too frequently forgotten.

Dr Hughes replied that he had never seen any ill effects from the use of iron instruments in close relation to the skin; but he believed that to avoid injury to the skin and soft parts it was essential that all such apparatus should fit *perfectly*, and allow of no friction whatever. As to the force used in the reduction of deformity, he could state that he had repeatedly seen Mr Thomas use considerable force in the treatment of club-foot by means of his wrench, but had never seen any bad results, nor any evidence of injury to the soft parts.

IV. ORIGINAL COMMUNICATIONS.

1. TETANOID CONVULSIONS IN AN INFANT; OPERATION; RECOVERY.

By T. R. RONALDSON, M.B., F.R.C.P. Ed.

MR PRESIDENT AND GENTLEMEN,—The child whose case forms the subject of this short paper was born on the 8th of December 1886. He was a strong, well-nourished boy, above the average size and weight, and the third child. The labour was easy and normal in every way. The umbilical cord was unusually thick, from an excessive development of Wharton's jelly. The mother nursed the child from the beginning, and continued to do so until the usual time for weaning, no other food than her milk being required.

After my visit on the 17th of December, when the child was nine days old, it was first noticed that there was something wrong. At times the child cried and was restless, the left eye winked, the muscles of the left side of the face twitched, and the left side of the tongue swelled up in marked contradistinction to the right side. These symptoms began so slightly and progressed so quietly that the mother and a most intelligent nurse did not think it necessary to send for me until the 19th, two days after the onset of the illness. Having been informed of the nature of the attack, and knowing how healthy the child was, and that the umbilical cord had not separated although it was the eleventh day, I began to connect the case, as I proceeded to pay my visit, with those cases of tetanus we read of as occurring so frequently among babies in certain countries, and whose starting-point seems to be the neglected or badly taken care of umbilicus. On my visit I saw no reason to doubt the accuracy of the opinion I had formed. The child was, apart from the convulsions, the picture of health, well nourished, with digestion perfect, and with evacuations natural in quantity, quality, and frequency. The anterior fontanelle was

somewhat fuller than usual, but that was entirely from the exceptionally well-nourished condition of the child. The temperature was normal, and continued so throughout the attack. The only unusual condition, apart from the convulsions, was that the cord had not separated. There was a distinct putrefactive odour about the black dried-up cord, but to the eye there was nothing to be seen but the usual amount of ulceration at the line of demarcation between the dead cord and the umbilicus. There was no inflammatory blush, no swelling, no unusual tenderness. At that time the convulsions were confined to the left side of the body; restlessness led on to tonic muscular contraction, and that was succeeded by well-marked clonic convulsions. Between the attacks the child was apparently perfectly well. I gave it as my opinion that probably the convulsions arose from some irritative condition at the umbilicus. I completed the separation of the cord with seissors, gave directions that the stump should be carefully washed at intervals with corrosive sublimate solution and dressed with zinc ointment; ordered one drop of chlorodyne to be given mixed with water in six doses, and expressed the hope that, as the supposed irritation at the umbilicus subsided, the fits would disappear. The fits got worse ; bromide of potassium and chloral, given up to 6 grains of the bromide and 4 grains of the chloral in the twentyfour hours, had no effect whatever in subduing their number or severity; nor had chlorodyne, 2 minims every four hours; nor had the local application of a 20 per cent. solution of cocaine, nor of the solid nitrate of silver. Warm baths increased them; they extended soon to the right side, and ultimately the whole muscular system was involved. They increased to the number of 204 in the twenty-four hours, while during their occurrence the tongue became blue-black, and at times well-marked opisthotonos supervened. On one occasion they were never absent for one whole hour, and for a period of nine hours the child was unable to suck in consequence of the frequency of the fits. When they did not come too rapidly, it took its nourishment greedily. They varied in frequency-from about 100 to 204 in the twenty-four hours-but not in such a way as to warrant us in believing that

Dr Brakenridge, who saw the child with me on 24th December and subsequently, confirmed my diagnosis, giving it as his opinion that the convulsions were not due to any disease originating in the brain, but that they were peripheral in their origin, and probably had the umbilicus as their starting-point. Meanwhile, in spite of treatment, and although the navel stump was quickly and nicely healing, the fits went on, and we asked Mr Chiene to see the child with us on 27th December, to help us in deciding whether the umbilicus should be excised. Mr Chiene's opinion was that the condition was allied to tetanus, and he advised that, before excision was' had recourse to, a more thorough antiseptic treatment of the

treatment, local or general, had any beneficial effect.

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stump should be tried. All medicine was stopped, and iodoform was carefully and diligently applied to the navel stump.

As no improvement resulted, chloride of zinc solution (40 grs. to <u>3</u>j.) was thoroughly applied on the 29th. That failing to benefit, Mr Chiene consented to excision, and on 31st December I freely and deeply excised the umbilicus. At once there was improvement, and the fits gradually decreased.

From 8 A.M., 4th January 1887, until the evening of the 5th they entirely ceased, but on that evening they again began. Next day I removed three silkworm-gut stitches which were apparently a source of irritation, as evidenced by an inflammatory blush around them, and the fits again began to decrease in number and severity. while at the same time the child slept more and took its nourishment better. As they did not entirely disappear, and as the nurse had previously noticed that the child was distinctly better at the time when, after the employment of carbolic lotion during the operation, the urine was dark coloured. Dr Brakenridge suggested the use of sulpho-carbolate of soda internally. On the 13th January it was prescribed in 4-grain doses every two hours. That quantity, however, upset the digestion, and the fits increased. The dose was accordingly diminished. The fits again disappeared, but they began to return mildly on 25th January, and reached the number of 23 in the twenty-four hours on 27th January, and sulpho-carbolate, which had been given up, was again administered. On this occasion the fits were not so severe, and after the first day or two they only affected the eyes and mouth, gradually becoming slighter. On the 30th of January one slight fit ended the attack, and the child has been in good health ever since. Dr Edington, who kindly examined the excised umbilicus, did not detect any special organism in it.

In remarking on this case I do not feel that I am called upon to try to decide the question whether the convulsive motor phenomena were due simply to peripheral irritation, or to the presence of some specific organism which had gained entrance at the umbilicus. I must leave the decision of that question to the pathological experts present.

As to the effect of treatment, my friend Dr Brakenridge, if I remember rightly, was of opinion that, in the first place, absorption of carbolic acid by the wound, and, in the second place, the administration of sulpho-carbolate of soda internally, had a distinct influence for good. My own opinion was that the excision of the umbilicus determined the recovery.

And, lastly, the occurrence of such a case raises the question whether the umbilical cord of newly-born children should not be treated more carefully than it generally is. I am in the habit now of tying the cord with thread soaked in corrosive sublimate solution, of directing the nurse to wash the cord with the same, then to surround it with sublimated wool, and to bathe it with the solution from time to time should any putrefactive odour occur.

The President thought the Society were indebted to Dr Ronaldson for his record of this very interesting case. The history seemed to point very clearly to a morbid condition in the umbilical scar as the source of irritation, especially the circumstance that the decadence of the cord had been so long delayed. Infective processes at the root of the cord were sometimes the cause of inflammatory mischief, and some of the German obstetricians insisted on the necessity in all cases of dressing the cord with antiseptic wool, as was practised by Dr Ronaldson. As to the use of a sterilized ligature for securing the cord, the President thought it was more important to tie the cord with an elastic thread or tape, which gave the greatest security against the occurrence of hemorrhage.

Mr Cathcart asked Dr Ronaldson how much of the umbilicus had been excised, in view of the doubt which exists as to whether tetanus is due to the poison produced by a special micro-organism acting on the centres, or acting upon the peripheral ends of nerves. Clinical evidence seemed to point towards both views. Undoubtedly, although some kind of contamination of a wound seemed to be necessary for tetanus, ordinary sepsis was often absent; and benefit had been known to follow the excision of a nearly healed wound.

Dr James Carmichael asked Dr Ronaldson whether there were any symptoms indicative of septic blood poisoning. He understood him to say there were not; but from the treatment adopted after consultation with Dr Brackenridge, in the administration of the sodium sulpho-carbolate, he presumed there must have been some reason for supposing there was blood contamination. Such spasms in children might be due, as was well known, among other causes, to altered blood conditions as well as peripheral irritation of any kind. The case he thought an interesting one, and well worthy of record.

Dr Felkin was much interested in hearing Dr Ronaldson's case, as he had seen some forty or fifty cases of tetanus occurring in newly-born infants in Central Africa. Most of the cases he had seen led him to agree with Dr Brakenridge's view of the case, but at the same time he had seen cases were there was undoubted septic infection. In Dr Felkin's experience the removal of the remains of the umbilical cord and the free use of antiseptics had been followed by marked benefit in at least half of his cases.

Dr Brakenridge said that the case which Dr Ronaldson had brought under the notice of the Society had interested him very much, and he thought there could be no doubt that the disease had yielded to treatment. It was impossible to draw any positive conclusions from one case; yet, while Dr Ronaldson was disposed to give the credit of the cure to the surgical operation, he wished to adduce a few reasons for believing that the benefit was rather due to the influence of the antizymotics employed,-viz, the carbolic acid dressing applied to the wound in the first instance, and the sulpho-carbolate of sodium administered internally afterwards. This belief was forced upon him by the progressive facts of the case, in opposition to the view he was at first disposed to take. When he first saw the patient he agreed with Dr Ronaldson in thinking that an operation was called for, as he believed that the fits were probably due to some peripheral irritation caused by an unhealthy condition of the umbilicus; and when, after the removal of a portion of the umbilicus, the fits ceased, he was satisfied that this view was probably correct. Subsequent events, however, decidedly modified this conviction. Soon after the operation Dr Ronaldson told him that, while the fits remained absent, the child had been so saturated with the carbolic acid of the dressing that there were symptoms of carbolic acid poisoning, and that, after simpler dressing had been substituted, as soon as the symptoms of poisoning had passed off the fits had returned in considerable severity. This struck him as remarkable. At Dr Ronaldson's request he called on Mr Chiene, who agreed with him in thinking that, in the circumstances, it would be wise to try the internal administration of carbolic acid or some similar drug, and Dr Ronaldson finally decided to give sodium sulpho-carbolate in suitable doses. Now, it was very remarkable that, very soon after the administration of the sodium sulpho-carbolate had been commenced, the fits ceased; still more so that on stopping the drug they recurred. This cessation and recurrence of the fits followed the giving and stopping of the drug several times; and the sulphocarbolate was finally given for a considerable length of time, and then gradually diminished. After it was stopped no further fits This case produced a strong impression on his occurred. Of course the final settlement of the case-surgical mind. treatment versus antizymotics-must depend on the final settlement of the true pathology of trismus. But here it might be noted that recent researches, and a careful inquiry into all the facts regarding the pathology of trismus neonatorum, were very strongly in support of the view that this disease was mainly due to the influence of a micro-organism. Hirsch, in his admirable haudbook on Geographical and Historical Pathology, said, "Among the authorities on lockjaw in the new-born, there is but one opinion, that the disease is almost confined to the crowded and filthy dwellings of the poor, or to badly kept foundling and lying-in hospitals, breaking out in the latter whenever the insanitary state arises as a result of overcrowding, or of an epidemic of puerperal fever, or the like." He referred, in confirmation of this, among numerous other facts, to Clarke's experiences of the Rotunda Hospital in Dublin, from 1757 to 1789, when, of nearly 2000 infants born, "16 per cent. died, most of them from trismus;" whereas, after hygienic reforms had been instituted, this mortality

was at once reduced to 5 per cent. Flüge, in his work on the Etiology of the Infective Diseases, referred to the researches of Nicolaier of Göttingen, who demonstrated that, when garden earth was introduced under the skins of mice and rabbits, there were frequently developed tetanic symptoms after an incubation period of 13 to 24 days. This was not the case if the earth was first previously heated to 190° C. Further, the disease could be transmitted by inoculation from animal to animal. Nicolaier was further able to cultivate the infective organisms. Carle and Rattone had recently excised the seat of infection, shortly after death, in a patient who died of tetanus, and made an emulsion of the tissue. Of 12 rabbits into whose dorsal muscles or spinal canal this emulsion was injected, 11 developed typical tetanus after two or three days' incubation. Beumer, Peiper, and others had obtained similar results. These researches were strongly in favour of the view he was inclined to take of this interesting and instructive case, and highly suggestive of the lines on which the future treatment of the disease might be expected to prove successful.

Dr Playfair listened with great pleasure to this very interesting case, and would also beg heartily to thank Dr Ronaldson for bringing it before them. While he thought it was likely the condition of the cord was the cause of the fits, he did not think it was absolutely proved to have been so. One or two points seemed to throw doubt on this. First, the condition of the anterior fontanelle, which was described as somewhat full, seemed to point to some brain disorder. The unilateral character of the fits, at least in their commencement, and the implication of the facial muscles, indicated also that the brain was involved. There might, therefore, have been in this patient some congenital or other brain discase, which either caused, or at least intensified, the convulsive seizures. The farther progress of the case should, therefore, he thought, be watched. The case was also extremely interesting, as showing how well some infants bear convulsive attacks. It was well known that reflex movements were extremely active in infants. probably due to the non-development of the centres controlling reflex movement.

Dr Aitken mentioned a case which showed the difficulty of accepting the "infective," or purely reflex character, of the convulsive seizures. An infant, whose father suffered from lung consolidation, with hæmorrhage, commenced about ten days after birth to cough very frequently and severely, with no physical sign in lungs. The first fear was tuberculosis, but a large granulation being discovered at the umbilicus, it was thought that the cause was reflex. Soon, however, the case developed into hooping-cough, which speedily attacked a second child in the house.

Dr Ronaldson, in replying, thanked the Society for their kind reception of his paper. In answer to Dr Carmichael's question with regard to symptoms of septic poisoning, he was able to state that there were no such symptoms, and that there were no other signs or symptoms of any disease apart from the convulsions, and they were, therefore, by exclusion, thrown back on the umbilical condition as the source of the illness. In reply to Dr Playfair, he would refer to his paper, where the anterior fontanelle is described as "somewhat fuller than usual;" and this is explained by the "exceptionally well-nourished condition of the child." That point was carefully considered, and they decided that there was no indication of brain disease. He had already stated that, in his opinion, excision of the umbilicus, and not the internal treatment, determined the recovery; but he was sure they all wished that Dr Brakenridge's view was correct, and that they had some medicinal agent which could help them in such cases.

2. SEQUEL TO A CASE OF OVARIOTOMY.

By WILLIAM TAYLOR, M.D., F.R.C.P. Ed.

PATHOLOGICAL REPORT.

By WILLIAM RUSSELL, M.D., F.R.C.P. Ed., Pathologist to the Royal Infirmary, Lecturer on Pathology, School of Medicine, Edinburgh.

TEN years ago I was walking towards the west end of Queen Street in company with a medical friend. He was discoursing with all the fervour of an enthusiast on a recent series of successful ovariotomies performed by him. He informed me that in several of these cases he had made use of a double silk ligature, by means of which he strangulated the pedicle. He then severed it, and, removing the ovary, allowed the ligatured portion to drop back into its place in the abdomen. In my innocence I inquired what became of the ligature? His reply was,—" God knows. It never gives me any trouble."

This answer startled me. It was not satisfactory to my oldfashioned mind. I was haunted with the idea of these ligatures remaining in the abdomen, where they might become centres of mischievous irritation, and I naturally desired to become possessed of the knowledge which the ovariotomist contemned. The career of the ligature, after its primary object was accomplished, although involved in obscurity, seemed a legitimate subject of inquiry, and I kept on searching for more light. In this quest the rays of reason alone were insufficient until blended with those of observation and pathology, and time was required to gather them into a focus. Meantime the ever-recurring question, What became of the ligature? presented itself in varying phases, of which the following may serve as examples :—

Ist, Did the ligature drop away through an avenue of pus, after its term of usefulness had expired, in the same way as the ligature used in the deligation of an artery finds its way to the surface ?

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2nd, If so, what became of the pus so imprisoned and the ligature so liberated in the abdomen ?

3rd, Did the ligature remain *in situ*, entailing months or years of detriment undefined and undefinable, but such as must always attend the presence of a foreign body within the tissues of the body —the presence of matter in a wrong place ?

4th, Did the ligature and its attendant products of pus and other disintegrated matter undergo solution, digestion, and absorption into the system ?

5th, If so, the pabulum would seem to be most unsuitable; but even if suitable, what became of the effete residuum which is attendant upon all processes of digestion? Did it also enter the circulation in a state of decomposition but non-assimilation, and was it carried onwards mechanically by the blood-current until it became deposited in some nook or eddy of lung or liver or kidney, where it set up business on its own account, and proceeded to disseminate and propagate amongst the surrounding tissues?

Whilst these problems were floating in my mind, I was consulted by a patient from England who had suffered for three years from menorrhagia. I treated her for two periods, but failed to stem the periodic flood. I consulted my friend the ovariotomist. After reviewing the treatment and its results, he at once recommended deligation of both ovaries as the only treatment likely to succeed.

This was agreed to. The operation was performed. Both ovaries were healthy; both were removed, and the ligatured pedicles were dropped back into the abdomen. The patient recovered from the operation. Nine years have since elapsed; no return of the menorrhagia has occurred, but she is still an invalid. She has never resumed work. Her intended marriage was broken off in consequence of the mutilation she had undergone, and thus possibly the real cure of her misery has been withheld. Meantime she remains ill, and but for the contingency of an opportune legacy she would be poor indeed. The question naturally arises, Have the embedded ligatures anything to do with this continued ill-health ?

More recently (1883) a very instructive case came within my observation. A patient from abroad came under my care. She had a left ovarian tumour of considerable size. I consulted my friend, and he decided to remove it. This was accomplished at Christmas. The stump was carefully cauterized, and returned to the abdomen. He then examined the right ovary, and found it healthy. He was in an operating humour. He examined it a second time, and said that, in order to make sure that it should not be the site of future disease, he would remove it. He applied a double silk ligature, removed the ovary, and allowed the ligatured stump to drop back into the abdomen. The patient's recovery was tardy at first, owing to her intolerance of morphia, which was injected in routine fashion. This routine was so obviously injurious that I protested against it, and on its being discontinued she made a steady recovery.

For six months she made little effort. Thereafter she became more active, and took outdoor exercise. She complained of nothing except occasional rheumatic pains, which were met by constitutional treatment.

Three years after the operation she suffered from a copious and offensive uterine discharge. This resisted all the ordinary treatment. All the parts within reach of observation were healthy. Ovarian disturbance could not account for it, for there were no ovaries. Still the discharge continued. Obviously the discharge proceeded from the site of the ligature. and found an exit through the still patent fragment of the Fallopian tube. Nothing was therefore done in the way of treatment beyond such an amount of warm douching as was required for cleanliness and comfort. The discharge continued steadily for months, varying in amount, but never absent; then it stopped for a few days; again it recommenced, and continued for varying periods; and so on for two years, when it finally ceased, and was followed by pain in the This interfered very much with active exertion, and gave back. rise to a constant feeling of weariness and lassitude. The uterine discharge never returned.

Shortly after Christmas 1888, five years after the operation, she returned from a visit to the country complaining of numbness of the right foot and leg. On examination, I found the foot and leg swollen, the sensibility greatly diminished, and the surface temperature of the foot reduced 3 degrees below that of the corresponding foot. The œdema extended to the thigh; but the sensibility and temperature increased from the ankle upwards, and were normal at the groin.

The dorsum of the foot presented two blanched bloodless patches of irregular shape, and measuring respectively $1\frac{3}{4}$ and $2\frac{1}{2}$ inches in diameter. These were completely insensible to the touch, and suggested approaching gangrene. The appearance of the whole limb indicated some very serious intra-pelvic obstruction to the circulation.

Could this be at the site of the ligature? and could the patent Fallopian remnant which had afforded an outlet through the uterus have become occluded, leading to an accumulation within and giving rise to an abscess, the presence and pressure of which was thus retarding the eireulation?

These were the natural questions suggested to my mind. The great question, however, was how to get the patient well again, and with this view I enjoined absolute rest in the recumbent position and warmth. This was accomplished by having the limb enveloped in a great thickness of carded sheep's wool, with the addition of hot bottles; and by these means the foot and leg gradually recovered, until at the end of fourteen days they had regained their normal appearance, and thereafter the surface temperature of the foot rose to one degree higher than that of the corresponding foot.

The patient was able gradually to resume her ordinary duties, but complained of pain in the back, which was somewhat intermittent in character, but she never felt well. In the following July she went to the country, and there she complained of an obstinate diarrhœa. Her diet, which had been unrestricted, was gradually altered, until finally reduced to milk and lime-water. On this she seemed to thrive, but the pain in her back increased, and became continuous. It had also changed its position from the left to the right side, and extended round towards the front. On her return to town in September I examined her, and found a large tumour occupying the right side, and extending from the liver, with which it seemed continuous, down into the right iliac space. The outer two-thirds were dull and palpable, the inner third resonant with the overlapping colon, and where this terminated a hard elbow-like projection could be felt. The manipulation of the tumour was unattended with pain.

The motions from the bowels were soft and clay-coloured, the urine dark and scanty. Rest was tranquil, and the intellectual powers unimpaired. The breathing was interrupted by occasional sighs, and savoured somewhat of pyæmia. The feet and ankles presented no appearance of cedema. The existence of very serious malignant disease was manifest; and Dr Wyllie, who concurred in this view, kindly assisted me with the further treatment of the case. This consisted chiefly of palliatives, rest, and warmth, with the promotion of gentle action of the skin and bowels. Operative procedure was inadmissible. Ten days after her return to town the kidneys refused to act, and there was no urine passed during the remaining ten days of her life. On the fifteenth day the motions suddenly changed in colour to an olive-black, and became very loose, copions, and frequent for thirty hours. Thereafter the hard knuckle at the edge of the liver could no longer be felt, and for a time she seemed to rally. Behind the uterus there was a hard mass, to which it was adherent; and Dr Wyllie suggested that a gynæcologist should make an examination, in order to ascertain whether, in the event of the ureters being involved and blocked in this way, operative procedure could be entertained. Dr Berry Hart kindly made the proposed examination, and found the broad ligament adherent on the right side, and the condition already described, but could offer no hope from an operation.

She gradually sank, and died on the morning of the twentysecond day. A post-mortem examination was conducted in due course by Dr Russell, and I will leave him to describe what he found. I asked him to pay special attention to the site of the

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ligature, and he examined it with great care. He also examined the part where the hard, bony-like projection had been felt. It was the site of the gall-bladder.

PATHOLOGICAL REPORT.

Owing to the operation which had been performed, attention was first directed to the uterus and its appendages. The pedicle on the left side presented no signs of prolonged irritation, there being, in fact, a marked absence of thickening either in or around The right pedicle had, on the other hand, been the seat of it. much and prolonged irritation, the evidence of this being found in the presence of dense fibrous adhesions in its neighbourhood, especially posteriorly, where the pedicle was incorporated with the parts in front of the sacrum and adjoining pelvis. On the uterine side of what looked like the seat of ligature there was a fourchambered cyst about the size of a small walnut, which contained purulent-looking material. The bladder and parts in front of the uterus appeared normal, but behind the uterus, and in the pelvis round the rectum, there was much fibroid induration and thickening the thickening extending to and involving the walls of the rectum. This condition, extending upwards along the connective tissues in front of the spine, produced a like thickening and induration in them; and in it both ureters were embedded, the left being so surrounded by this new tissue as to lead to its complete blocking, while the right was not so completely blocked. The left ureter was not only blocked and surrounded by this fibroid growth, but its wall evidently shared in the process, and was itself thickened. The process extended from the tissues immediately in front of the spine to the pancreas, the head of which it surrounded, and partially, at least, penetrated. Laterally it extended to, surrounded, and involved the suprarenal capsules to such an extreme degree that the left capsule could not be recognised in the indurated tissue occupying its normal site. In addition to this somewhat diffuse condition there was, in the great omentum, a scar-like puckering and a hard nodule under an inch in diameter. The mesentery was thickened somewhat generally, and at one part it contained a calcareous mass, presumably a gland. At the cæcum there was an area where the mesentery was the seat of a localized induration, accompanied with marked puckering of the part, but not causing obstruction. The left kidney, from the blocking of its ureter, presented the ordinary appearances of advanced hydronephrosis. The right kidney showed slight distension of its pelvis and calyces-the organ itself being large, swollen, cloudy, and somewhat fatty. The liver contained a considerable number of small whitish malignant nodules about the size of a sixpenny-piece in circumference.

Microscopical examination showed the new tissue to be mainly fibrous in character, but in it at the parts examined—as, for example, round the left ureter and the nodule in the omentum there was an adenomatous structure, suggesting, and in parts closely resembling, proliferous cystadenoma of the ovary. In the liver the structure of the nodules was more that of an ordinary carcinoma.

The case, from a morbid anatomy standpoint, offers various points for discussion, which will probably be dealt with at some future time when the wider questions involved are considered. Meanwhile the opinion may be expressed, that the irritation round the ligature appeared to be the starting-point of an irritation which acquired, if it did not originally possess, malignant characters, and led to the condition briefly sketched in this report.

Dr Berry Hart thought Dr Taylor's paper and the result of Dr Russell's post-mortem examination exceedingly valuable. It must be remembered, however, that trouble with the ligature was very rare, and that practically its use was exceedingly valuable. 'He doubted whether Dr Russell had established his point as to malignant disease; the description given seemed to suggest some atrophic connective tissue change analogous to Freund's parametritis atrophicans. Dr Russell's opinion, however, was of more value than his.

Mr Cathcart asked Dr Taylor if the exact condition of the excised ovaries and tubes was known. Possibly an originally malignant growth in the ovary had returned after its apparent removal. Sir Joseph Lister had pointed out many years ago that silk ligatures are very slowly absorbed, and may become a focus of suppuration, if suppurative micro-organisms should get access to the circulation.

Dr Taylor replied that the left ovary, for which the operation was performed, had no appearance of malignancy, and no microscopic examination was even suggested by the appearances. It consisted of what one might call a large and several small normal cysts. Had *it* been malignant, the pedicle of the right side, and not the left, would have been the seat of the subsequent mischief. The right ovary, which was removed, was healthy. It was removed more as a precautionary measure, in case it should afterwards become like the left one.

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Meeting XII.-July 2, 1890.

Professor A. R. SIMPSON, President, in the Chair.

I. EXHIBITION OF PATIENTS.

1. Mr Francis M. Caird exhibited a case of recovery after AMPUTATION FOR SPREADING GANGRENE. This was the case of a man, æt. 22, who was admitted with a poisoned wound of the hand, the result of a bite received in a fight a week before. Moist spreading gangrene ensued in spite of free incisions; the hand and lower part of the forearm died, and the limb was brawny and covered with bullæ. Amputation was performed through the upper third of the humerus. The patient swam for his life for a few hours, and required copious stimulation, but ultimately made a good recovery.

2. Prof. Greenfield exhibited-(1.) A case of THOMSEN'S DISEASE, and described the leading features of the condition. The patient, a lad of 19, had been under treatment in various hospitals, and his case had been fully recorded by Drs Hale and Sweeten of Cardiff in the Brit. Med. Journ. for January 1890, and by Dr Hale White in the Guy's Hospital Reports for 1889. (2.) A case of DISEASE which presented some characters allied to those in Thomsen's disease, but also others more allied to pseudo-hypertrophic paralysis. From the fact that he had not been able to discover any similar case on record, he had been driven to give a name derived from the leading anatomical change discovered, and called it progressive diffuse myosclerosis. The patient, a man 44 years of age, had been under observation for four and a half years. There was a progressive enlargement of the muscles, followed by their contraction and atrophy, producing great deformities. Microscopical examination had shown the change in the muscles to be a chronic interstitial inflammation, but it was not attended by any marked weakening of the muscles, except in proportion to their subsequent atrophy and shortening. One of the most remarkable phenomena was the extreme readiness with which tonic contraction of the muscles was excited by voluntary movements, and the very long period of persistence of the contraction, which was from twenty to thirty seconds, or even longer. It could even be excited by passive movement during sleep, or whilst the patient was under chloroform.

II. EXHIBITION OF SPECIMENS.

1. Dr John Playfair exhibited a specimen of STENOSIS OF THE INTESTINE due to the pressure and adhesions of a mass of enlarged tubercular glands. The preparation was obtained at the post-

mortem of a girl of 11, who was admitted to the Children's Hospital on the 24th March, and died on 15th May 1890. She had always been a delicate child. Her illness began, six weeks before admission, with pain in the abdomen, and diarrhœa. Vomiting also set in. When admitted she had no diarrhœa and very little pain, but soon vomited a large quantity of undigested food mixed with mucus, and of a greenish colour. No abnormality could be detected in any of her organs, and no abdominal tumour could be felt. She continued to vomit at irregular intervals, and gradually to emaciate till she died. Her temperature kept normal or subnormal throughout. Her bowels were constipated, and were moved by enemata. On one or two occasions the motions contained dark-coloured blood. The day before she died a small mass about the size of a hen's egg was felt lying about an inch above the umbilicus, and to the left of the spine. The post-mortem revealed a mass of enlarged tubercular glands the size of a small orange, lying behind the third portion of the duodenum. The glandular swelling had formed adhesions to the pyloric end of the stomach. and head of the pancreas and duodenum, and constricted the lumen of the bowel to the size of a No. 2 or 3 catheter. Above the constriction the duodenum was much dilated. The mesenteric glands near the ileum were found enlarged, and in the small intestine were a number of small tubercular ulcerations, with minute deposits of tubercle in the subserous coat.

2. Dr John Thomson exhibited a drawing and specimens of a FROZEN SECTION OF THE SPINAL COLUMN from a case of Pott's disease. The patient was 9 years of age, and had suffered from spinal disease for more than eighteen months. The body of the ninth dorsal vertebra had been almost entirely destroyed by disease, and a portion of dead bone was seen to be forced against the posterior aspect of the pleura by the displacement. There were a few recent adhesions in the pleural cavity in the neighbourhood of the disease, and had the child lived a little longer, empyema would probably have been produced. The cervical spine was also extensively diseased, the intervertebral cartilages between the second and third and third and fourth vertebrae being quite destroyed. Some weeks before death an abscess had formed in front of the bodies of the cervical vertebre, which burst into the pharynx, and tinally led to extensive gangrene of the connective tissue of the neck, owing to food entering into and decomposing in its cavity.

3. Dr Burn Murdoch showed an ENCHONDROMA OF THE RIGHT LUNG and CAST OF LEFT HAND and PHOTOGRAPHS from a patient, aged 34, who suffered from multiple enchondromatous tumours of right and left metacarpal and phalangeal bones since childhood. Two years before patient's death there appeared a large chondrosarcoma on the right scapula, involving the clavicle. This was followed by rapid development of growth, with emaciation. On 17th December 1883 Dr P. H. Watson removed the arm, scapula, and outer third of clavicle. The tumour was at least as large as a man's head. Recovery was rapid. Symptoms of double pleurisy, with effusion, occurred in October 1884, and death took place in November 1884. Both lungs were found studded with chondrosarcomatous growths, varying in size from a pigeon's to a hen's egg, and there was copious clear effusion into both right and left chest.

4. Dr James Ritchie showed a specimen of GASTRIC ULCER from a male, aged 43. He had for years suffered from indigestion, but for some weeks had been worse. He complained of pain, gradually increasing until relieved by vomiting at intervals of a few days. Fluid in considerable quantity was put up, and on a few occasions it had contained material like coffee grounds. Ou examination, the stomach was considerably dilated; there was marked splashing on palpation, tenderness in right hypochondrium; the vomited matter contained sarcena. After consultation with Professor Grainger Stewart, it was decided not to wash out the stomach through fear of hæmorrhage. The diagnosis was ulcer at pylorus, contraction of that orifice (partly spasmodic), and dilatation of stomach. Before treatment was begun there was a very copious hæmorrhage, blood being passed both upwards and downwards in large quantity, leaving the patient very prostrate. There was no recurrence of hæmorrhage for six weeks, during which time there was marked improvement; then small hæmorrhages frequently recurring exhausted the patient. There were several points of clinical interest: the complete absence of sarcinous vomiting after starchy and saccharine food had been excluded, the consciousness of the patient when food was leaving the stomach in consequence of pain and gurgling, the ability of the stomach to deal satisfactorily with a limited amount of suitable food. The ulcer was at the pylorus, its base formed by the pancreas. The wall of the stomach much thickened near the ulcer; an artery of considerable size was opened into, probably the pyloric inosculating with the coronary. It is a matter of wonder that the hæmorrhage was arrested at all.

III. ORIGINAL COMMUNICATIONS.

1. NOTE ON THE TREATMENT OF COLD ABSCESS.

By F. M. CAIRD, F.R.C.S. Ed., Assistant Surgeon, Royal Infirmary ; Lecturer on Surgery, Edinburgh School of Medicine.

DURING the past few years various methods of treatment for large cold abscess have been introduced. These have had for their object the reduction of the somewhat protracted stay in hospital which has hitherto been necessary, as well as a corresponding diminution in the amount of dressing and the anxious care which such cases afford.

Sir Joseph Lister's plan of opening and draining the abscess with the most stringent antiseptic precautions, while at the same time continuous rest was obtained by means of the long splint, extension and careful nursing, was one in which the vitality of the surrounding tissues was called into play to react upon the abscess wall and cause its absorption.

The results as seen in his practice (vide Mr Watson Cheyne's *Antiseptic Surgery*) are simply unrivalled, and constitute an enduring monument to the training, zeal, and fidelity of his house surgeons and staff.

The time occupied in the absorption of the pyogenic membrane and in the cure of the associated caries is, however, often very lengthy, and the slightest mishap at dressing may undo the care of months. Attempts have therefore been made to obviate this by a direct attack on the unhealthy granulation tissue of the abscess wall, either by the introduction of suitable agents, such as iodoform, or by removing it with the sharp spoon, and endeavouring to get the raw surfaces to unite by means of judicious support, pressure, or buried sutures.

It is to illustrate what may be done by removal of the abscess wall and the attempt to get a union by the first intention that the following cases are recorded.

The method is briefly as follows:—The patient having been chloroformed and the skin shaved and carefully purified with carbolic lotion (1 to 20), the abscess is opened by a small incision, into which the finger is at once passed. The whole of the wall which is accessible is now scraped bare with the finger nail. It is easy to feel the pyogenic membrane peeling off in large flakes and shreds, and the finger readily recognises when a perfectly raw surface is left. If the entire extent of the wall is not accessible, a second incision is made, the first opening is plugged, and from the second aperture the remainder of the cavity is now scraped bare. It is advisable not to allow any pus to escape, since one can more easily strip off the lining membrane and judge of the thoroughness of the scraping when the abscess is distended.

With the finger-nail we may scrape away the granulation tissue with impunity from off important structures, and the finger pulp tells exactly how much is being done and how much has to be done—in this respect differing widely from the sharp spoon, which cannot be used with the same freedom or accuracy.

The pus is now allowed to escape, and the cavity is thoroughly washed out with boiled boracic lotion, warm, until the fluid streams away clear and transparent. Very short tubes may now be inserted if need be, and a couple of sutures should be put in the wound, but not tightened up. The dressing consists of a large mass of moist gauze wrung out of earbolic lotion, and over that a large corrosive wool mass, secured in position by carefully-applied bandages of domet. Over all a piece of elastic webbing is carried, and the patient kept absolutely quiet in bed by means of suitable splints. On the following day the tubes may be removed and the stitches tightened up. Future dressings are determined by the rules common to antiseptic surgery.

CASES.

I.—C. H., æt. 22, a nursemaid from Shetland, was admitted to the Royal Infirmary suffering from a large gluteal abscess. Family history and general state of health good. About two years ago she fell on the ice. The buttock then gradually became swollen; she limped slightly; complained of nocturnal pain, and lately has had starting of the limb. Prolonged rest and iodine applications have been tried without benefit. On examination there is found a large fluctuating mass, which lies under the gluteus maximus, and extends from the anterior superior spine to below the gluteal fold, causing the right buttock to project enormously. The abscess was opened, as above indicated, on 12th July. It was dressed on the 13th, 14th, 15th, 17th, 19th, and 21st. On the 23rd a collodion dressing was applied, and on the 8th August she left for Shetland.

II.—H. C., æt. 48, crofter, Shetland; family history uncertain. In March last, gaining the crest of a hill, he was blown over by a gust of wind. He was thrown on his hip, and experienced great pain in the thigh and spine. In June swelling of the thigh was marked. It was aspirated on two occasions, but latterly has rapidly increased. He is in poor health, has lost flesh rapidly, is rheumatic, and suffers from iritis. The abscess stretches from the lower third of the thigh upwards, and is lost and ill-defined beneath the gluteal muscles.

On 24th September the abscess was treated. Two incisions were requisite on account of the size of the cavity, and the finger was inserted and the wall scraped from one incision above the gluteal fold, and a second about the middle of the thigh. A long splint was applied, and daily dressings made use of till 27th September. On the 2nd October the long splint was removed. The limb was again dressed on the 5th October. A little serum was found on changing the dressing on the 13th and 19th October. The patient left on the 24th healed.

III.—K. F., æt. 7, suffers from Pott's curvature and double psoas abscess. In the right groin there is a scar due to an abscess which was opened last year, and for which she was treated for eight months in an hospital. Each lumbar region and groin is occupied by a large fluctuating swelling. The abscesses are evidently distinct and separate, and do not communicate across the spine. On January 1st, 1890, each collection was opened below Poupart's ligament; the finger was then introduced and the wall scraped as far as possible. A large bougie was then introduced, and the point made to project in the loin where it was cut down upon, the finger again inserted here, and the scraping of the upper portion of the cavities completed. The right collection contained pure serum alone; the left contained pus, and on the left side of the second lumbar vertebra a distinct hollow was found, from which were removed three small portions of necrosed bone. The walls of this depression were rather smooth and not distinctly carious. A double long splint was applied.

The patient had headache, diarrhœa, retracted abdomen, and dilated pupils for a day or two after the operation, and her condition gave rise to some uneasiness. It was thought advisable to dress rather frequently in this case from the risk of soiled dressings. On the 18th January the left side was sound, and on February 12th the right side was healed. She was kept in bed till March 18th.

IV.—J. M⁴K.,æt.16,sawyer, Killin. A strumous lad, who already has had excision of his left os caleis, and who suffers from phthisis, caries of the left ankle, and abscess of the popliteal space. On the 28th October the foot was removed, and the abscess which filled the popliteal space was scraped. On the following day it was dressed and the sutures tightened. There is no further record of dressing, but on the 28th November he left for home healed. On re-admission with disease of the right hip-joint, the popliteal space was found sound and well.

Similar results were gained in a comparatively short space of time in a series of ten smaller chronic abscesses of the neck and lower extremity. Two cases were not successful, but in one of these, in which the pus lay beneath the calf muscles and extended into the popliteal space, no spitint was applied, and the wound became septic. The other case was already septic, and the imperfect clearing out of long sinuses about the pelvis and sacroiliac synchondrosis led to a general infection which nearly cost the patient her life, from septic pneumonia, empyaema, and fever. She, however, ultimately made a most satisfactory recovery.

The temperature remained practically normal in all the cases save the two which were septic.

Dr James Ritchie remarked that in the days of Syme, and even at a later period, it was considered a very dangerous proceeding even to squeeze the pyogenic membrane of chronic abscesses with the fingers; to-day Mr Caird showed the great advantage of removing that membrane completely, and by means of the finger only, the results being far in advance of the old treatment. Mr A. G. Miller expressed his interest in the subject of Mr Caird's paper, and thanked him for the interesting manner in which he had treated the subject. The treatment by scraping was common, but he thought Mr Caird's suggestion to use the finger only was a good one, as the operation could be more carefully performed. Mr Miller thought, however, that the important points in the treatment of such cases were the approximation of surfaces and rest after evacuation. Cure might, however, be expedited and made more certain by the scraping. After hearing Mr Caird's paper, Mr Miller would give more attention to scraping with the finger-nail.

2. CROUPOUS PNEUMONIA IN CHILDREN.

By JOHN PLAYFAIR, M.B., F.R.C.P. Ed., Physician, Royal Hospital for Sick Children.

CROUPOUS PNEUMONIA in children is, in its pathological results, and in some of its signs and symptoms, the same affection as seen in the adult. In the child, however, it has its interesting peculiarities. It is my purpose to draw attention to a few of these, and at the same time to point out some of the general features of the disease as more prominently manifested in the child.

With this design I bring before you a series of thirty cases of croupous pneumonia in children, all of which were treated in my ward in the Children's Hospital. To facilitate their consideration I have tabulated them, and I shall now offer some remarks on a few general points of interest brought out by this arrangement of the cases.

First, then, as to the ages at which the cases occurred. As is well known, croupous pneumonia is very uncommon under the age of 2. At that period of life pneumonia is common enough, but it is nearly always of the catarrhal variety. Above the age of 2 the two kinds of pneumonia seem to occur with about equal frequency, with a gradual tendency for croupous to become more common the nearer adult age is reached. Amongst the cases before us, Nos. 1 and 30 only were under the age of 2 years. Both of these were undoubted cases of croupous pneumonia, with typical fever and characteristic physical signs. No. 30 was exceptionally severe, and ended fatally, after a relapse followed by an attack of measles. Nineteen of the cases occurred between the ages of 18 months and 6 years; eleven between the ages of 7 and 12 years.

The sexes were about equally represented, fourteen being males and sixteen females.

The right lung was affected in sixteen of the cases, in eleven it was the left, and in three both lungs were attacked. As to the region of lung affected, in twenty-one it was the base, and in eight the apex. In one case the whole lung was consolidated by the time of admission, and it could not be determined where the disease began. According to these observations the lower lobes of the lungs in children are much more frequently attacked than the upper, and this is in accordance with the statements of most writers on the subject. Henoch states that out of 124 cases of croupous pneumonia observed by him, ninety were basilar and thirty-one apical, and three in which the whole lung was affected. Goodhart also found that out of 120 of his cases, in eighty-five the lower lobes were attacked. In children the prognosis is little, if any, affected by the region of the lung inflamed. Cases of apical pneumonia make as good recoveries as those in which the lower lobes are the seat of the disease. Indeed, Eustace Smith affirms that "inflammation of this part (the apex) of the lung, in the large majority of cases runs in the child an especially short and favourable course."

In my two fatal cases, though in both the whole lung ultimately became affected, the disease began in each at the base. All the eight cases in which the apex was involved made good recoveries.

It was at one time supposed that apical pneumonia in children was specially associated with nervous symptoms. Rillet and Barthez described a pneumonia which they called "cerebral pneumonia," and in which they said the apex of the lung was nearly always attacked. Most authorities now hold that nervous symptoms in the croupous pneumonia of children are not associated with any particular region of the lung. Nor does it seem any more true, as stated by Steiner, that otitis is a frequent accompaniment of pneumonia in children with cerebral symptoms.

As regards the cases under consideration, eleven are stated to have suffered from nervous symptoms, such as headache, delirium, herpes labialis, etc., but in only four of these was the upper lobe the seat of the disease.

Let me now take up another division of the table of cases, namely, the previous illnesses from which they suffered. Measles, I find, stands prominently out in this respect. Thirteen of the cases suffered from this disease at some period of their life anterior to their attack of pneumonia. Eight had had whooping-cough, while other diseases of childhood occurred so infrequently as not to require mention. Measles and whooping-cough are supposed frequent sources of lung affection in children, but it has also to be kept in mind that they are probably the most infectious. This may therefore well account for the fact that they are the most common previous illnesses to any particular disease, without in any way looking upon them as a cause of that disease.

Two of the columns in the table are headed Date of Onset and Date of Termination; and before proceeding further, some explanation of these terms is necessary. Obviously it is impossible to fix exactly the time when an attack of pneumonia begins and when it ends. What is meant by the date of onset is the day when the illness of the patient was first noticed, not the day of admission to hospital.

	Remarks.	Head symptoms at first. Tem- perature fell to 98° on the 17th March. Was dismissed 24th	March with slight dulness re- maining at left apex. Re- admitted to Ward L, April 3rd. Attack began with vomiting and headache. Temperature normal	on 3rd April. Was admitted as suffering from typhoid fever. Dulness at richt anex discovered on 22nd	Nay. The pleurist at left base also. Temperature fell to	normal on 2nd June. Admitted June 11th for severe attack of chorea. Temperature	rose suddenly to 102° 6 on 22nd June. No chest physical signs till June 25th. By July 3rd the right apex was free from	signs of condensation. Tem- perature fell to subnormal, and remained so on 29th June. Illness began with diarrhoca and vomiting, and great abdominal	pain. Lemperature ten to normal on oth April. Slight herpes on nostrils. Tem- perature fell to normal 31st July.
	Result.	Improved.	Recovered.	Recovered.	Recovered.	Recovered.		Recovered.	Recovered.
	Date of Termination.	(2)	8th April 1884.	27th May 1885.	15th June 1885.	3rd July 1885.		20th April 1886.	4th August 1886.
	Date of Onset.	18th March 1884.	27th March 1884.	16th May 1885.	28th May 1885.	22nd June 1885.		1st April 1886.	23rd July 1886.
	Previous Illnesses,	Rickets.	Measles, scarlet fever, and	whooping-cougn. None noted.	Rickets.	Measles, chorea.		None.	Measles, scarlet fever, and whoop- ing-cough.
	Lung, and region of Lung affected.	Left Apex.	Right apex, and possibly left also.	Right apex.	Left base.	Right apex.		Left base.	Right base.
ľ	Sex.	М.	Ľ.	ц.	ц.	н.		ц.	Ľ,
	Age.	-(0)	6	6	~~	6		9	9
	Name.	J. H.	M. M.	J. G.	. М. А.	E. C. D.		К. Н.	M. B.
	No.	H	0	3	4	5		9	7

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CROUPOUS PNEUMONIA IN CHILDREN,

Illness began with headache and vomiting ; had noisy delirium. Temperature rose to 107° 4 on	evening of 31st. Fell next morning to 98°. Was irregular for a day or two, and finally fell to subnormal on 5th Feb.	Illness began suddenly with head- ache and vomiting. Herpetic eruption on upper lip. Tem-	perature tell to normal on 18th. Illness began with vomiting, purging, and headache. Tem- perature very irregular, did not	lall to normal till 29th. Pattent was occasionally only semi- conscious. Some pleurisy on richt side.	Began with vomiting and purging. By the 7th whole right lung had become consolidated, and	friction heard at base. On the 13th a decided fall of tem- perature. Physical signs did	not improve, and temperature never became normal. On the 24th July evident signs of	fluid in chest. Illness began suddenly during night with vomiting. Slight	pleurisy at left base also. High fever and delirium from the commencement of illness till	10th Jan., when temperature fell suddenly to 99°. Some dry pleurisy also develomed on	right side.
Recovered.	•	Recovered.	Recovered.		Recovered.			Recovered.	Recovered.		
20th Feb. 1887.		22nd April 1887.	6th June 1887		4th Sept. 1887.			12th Nov. 1887.	30th Jan. 1888.		
19th Jan. 1887.	-00-11 V 17	9th April 1807.	10th May 1887.		rst July 1887.			27th Oct. 1887.	5th Jan. 1888.		
Whooping-cough.	-	Measles and whooping-cough.	None.		None.			Measles and bronchitis, several	attacks. Whooping-cough and measles.		
Double, both bases.	1.1.1	Kignt base.	Right, whole of, though seems to have begun at	Dase.	Right whole lung. Began at apex.			Left lower lobe.	Right lower lobe.		
M.	Ĥ	ι. Έ	ц.		м.			F.	M.		
~	c	<u>م</u>	4		61			6	IO		
W. M'C.	۲ ۲	ч ч	J. W. A.		I. S.			M. M'G.	J. M.		
00		6	IO		II			12	13		

Remarks,	High fever, which fell to 99° on 11th. Had bloody expector-	ation. Slight bronchial catarth in right lung. Was three days in hospital with high fever and quiet breathing before physical signs developed. Temperature fell suddenty on	May 11th. Both lungs had practically cleared up by 16th	Temperature fell to normal on 15th May. Redux crepitation well marked	Temperature fell to normal on 6th June. Some dry pleurisy	on right side also. On admission on July 21st thought to be suffering from	dominal pain, and distension. Chest noted as normal. On	July 25th signs of consolidation of left lung first noticed. Bad family history. Some pleur- itic effusion at left base also. Had also a distinct mitral systolic murmur. Temperature fell suddenly on 24th July.
Result.	Recovered.	Recovered.		Recovered.	Recovered.	Recovered.		Recovered.
Date of Termination.	16th April 1888.	22nd May.		23rd May 1888.	10th June 1888.	15th Aug. 1888.		znd Aug.
Date of Onset.	5th April 1888.	7th May 1888.		12th May 1888.	1st June 1888.	18th July 1888.		20th July 1888.
Previous Illnesses.	Measles.	Unknown.		Unknown.	Measles, whoop- ing-cough, and	chicken-pox. None.		None.
Lung, and region of Lung affected.	Left lower lobe.	Right lower lobe and left apex.		Right lower lobe.	Right lower lobe.	Left lower two- thirds.		Left lower lobe.
Sex.	F.	M.		М.	F.	M.		M.
Age.	12	3		7	6 2	3		5.5
Name.	E. S.	С. К.		R. M.	A. R.	.н.м.ц		D. G.
No.	14	15		16	17	18		19

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Illness began suddenly with vomiting. Fever reached 106° on 5th day. Fell to subnormal	on 9th day. Pneumonic physical signs did not develop till 4th day.	Illness began with headache, vomiting, and drowsiness.	Herpes labialis. At post- mortem a gangrenous cavity	Temperature fell to normal on	Temperature normal on 5th Jan. Some catarrh of left lung.	Vomiting a prominent symptom continued for some days.	Temperature normal on the 10th	Had 2 distinct attacks. In first	and by that time dulness and	tub. breathing had quite dis- appeared. Temperature again	rose suddenly on morning of	15th Feb. to 103 °0. 1 empera- ture fell to normal on 24th Feb.	By 27th Feb. chest had cleared.	Took chicken-pox on 4th March.	Temperature typical. Fell sud-	deniy to 97 on 17th (Mth day). Veryfew physical signs through-	out. By the 17th chest was per- fectly normal. Herpes labialis.
Recovered.		Died.		Recovered.	Recovered.		Recovered.	Recovered.							Recovered.		
1888.		1888.		1889.	1889.		1889.	27th	1009.						1889.		
30th Sept.		21st Dec.		8th Jan.	12th Jan.		ı 5th Jan.	30th Jan.	r ebruary						17th Feb.		
1888.		1888.		188S.	188S.		1889.	18th	.600						1889.		
19th Sept.		14th Dec.		25th Dec.	23rd Dec.		ıst Jan.	20th Jan.	rep. 10						Ioth Feb.		
Whooping-cough.		Mcasles and whooping-cough.		Synovitis of left	Measles and meanonia.	4	Measles.	None.							Pleurisy and	measles.	
Right upper lobe. Signs of conges- tion at left apex	also.	Double. Nearly the whole of left	lung and base of right. Began at	base of left lung. Left apex.	Right base.		Left base.	Right lower lobc.	kight base.						Right base.		
M.		M.		M.	М.		H.	ц.	_						H.		
~		9		4	9		9	10 10							13		
J. S.		G. S.		A. S.	R.* B.		C. M'F.	J. B.							G. A.		
20		21		55	53		24	25							26		

Remarks.	Temperature characteristic, fell to subnormal on 6th March (6th (ay), Herpes labialis, Evi-	dently some remains of an old pleurisy on right side. Right half of chest measured 9 in. Left half 9 ³ . By 30th March chest was quite normal. Was ill a week before admission with abdominal tenderness and fever. By the 18th the whole lung was involved. Lung very slow in clearing up. Tempera-	ture jerky. Became normal on the 30th. On April 2nd, note on percussion over right lung was almost normal. Temperature fell to 100° on the 26th, and to subnormal on 29th. Duhess had begun to clear on the 28th. Hornes labilis	Whole left lung consolidated by time of admission on 22nd Nov. By Dec. toth left lung had cleared. Temperature began to rise again about the 18th. On the 21st temperature foll to subnormal. On evening of 22nd temperature rose again, adm on 27th measle rash showed
Result.	Recovered.	Recovered.	Recovered.	Died.
Date of Termination.	1 5th March 1889.	Removed April 3rd, greatly improved.	8th April 1889.	7th Feb. 1890.
Date of Onset.	1st March 1889.	8th March 1889.	22nd March 1889.	19th Nov. 1889.
Previous Illnesses.	Pleurisy.	Measics.	Pneumonia, measles, disease of bone of arm.	None.
Lung, and region of Lung affected.	Right apex.	Right, whole lung. Began at base.	Left, lower ^g ths.	Left, whole lung and left base. (Two attacks.)
Sex.	н.	М.	۲.	М.
Age.	2 V	4	Q	12
Name.	J. M.	С. К.	E. C.	H. M.
No.	27	500	29	30

The beginning of an attack of croupous pneumonia in a child is usually more sudden than in the adult, and is, as a rule, marked by some well-defined symptom, such as vomiting or purging, or headache with fever, but seldom by a rigor. The date of onset taken thus can therefore be fixed with tolerable certainty. By the date of termination is meant the day the lung was noticed free from all abnormal physical signs. Clearly this is a much more difficult period to determine, and therefore cannot be looked upon as so reliable as the former. It was fixed as carefully as possible, however, with a view to determine the duration of the attack.

Leaving out case 6, which ended as an empyema, and was many weeks before complete recovery took place, and case 30, which had two attacks of pneumonia, and afterwards took measles and ended fatally after a long illness, and not reckoning case 1, who was removed from hospital before he recovered, we get twenty-seven cases, with an average duration of nearly fifteen days.

I am uncertain how this compares with what takes place in adults, but I imagine it must take considerably longer for a pneumonic adult lung to lose all traces of consolidation.

Two of my little patients passed through their attacks and lost all pneumonic signs in seven days. Another case died on the seventh day. The most prolonged case occupied twenty-eight days,—this lengthened period being accounted for by a relapse which took place about the sixteenth day, but ultimately the chest entirely cleared, and the patient made a good recovery.

Crises occurred in twenty-one of the cases, and in by far the greater number—namely, in thirteen of these—it took place on the fifth or sixth day. The earliest crisis was on the third day, the latest on the fifteenth. The case in which this late crisis occurred—No. 8—was one of hyperpyrexia, the temperature having reached 107° 4 on the eleventh day. From this, after a dose of 5 grains of antipyrin, it fell in a few hours to 98°, but rose to 103° the next evening, and was irregular for a day or two before the final and permanent fall took place on the fifteenth day of the illness. This patient also made an excellent recovery.

Of the nine cases in which crises did not occur, two ended fatally. The prolonged and gradually diminishing fever in the other cases appears to have been caused by complications of pleurisy or peritonitis, or by slight farther extensions of the pneumonic process. Henoch found that crises occurred in seventy-two out of eighty-two cases, and that that event occurred in the great majority of the cases (lifty-three) between the sixth and eighth days, rather later, therefore, than in most of the cases before us. "Very rarely," he says, "did the crisis take place on the third or fourth day, and in only one did it occur on the seventeenth day."

There is a practical point connected with the fever of the croupous pneumonia of children, and that is, that when the fall of temperature takes place, it is usually rapid and decided, and is

2 d

frequently accompanied by great prostration and cardiac weakness. Alcoholic stimulants and heart tonics are, therefore, at this time often urgently called for, and usually give gratifying results, as children respond to such medicines much more promptly than do adults.

It is of some interest to determine the seasons of the year at which the cases occurred, and the table shows that with certainty. Seven are found to have happened in winter, ten in spring, eleven in summer, and two in autumn—that is, the large proportion, namely seventeen, occurred in the winter and spring months, as against thirteen in the summer and autumn months.

Although the larger number are thus credited to the colder months of the year, it is remarkable that as many as thirteen of them, or nearly a half, happened in the warmer months. It points to the conclusion that a low atmospheric temperature cannot be a very potent factor in the etiology of the disease, and supports the microbic theory of the causation of pneumonia in so far as a high temperature is conducive to the growth of disease germs.

Let me now say a few words regarding some of the commoner complications of croupous pneumonia of children, and first as to complications arising from involvement of the nervous system. It has already been pointed out that the region of lung affected seems to have little or nothing to do with the production of nervous symptoms. In children generally the nervous system is more susceptible than in the adult, and therefore one would expect a more frequent occurrence of nervous symptoms in pneumonia. I feel doubtful, however, if such is the fact. Among the cases under consideration eleven are noted as having suffered from nervous symptoms, but these in most of the eleven were triffing. In five only were the great nerve centres very decidedly affected.

Case 5 was very interesting and singular. A girl, aged 9, she was admitted on June 11th, 1885, suffering from a severe attack of chorea. Lungs and heart were normal. She improved under rest and other treatment till the 22nd June, when her temperature suddenly rose to 102°.6. She was repeatedly and carefully examined, but nothing could be detected to account for the rise in temperature, which continued high till June 25th, when there was noted "slight impairment of percussion note at right apex, and weak vesicular breathing with occasional click at end of inspiration over dull area." On the 27th the report is, -- "Note over right apex distinctly dull, and breathing markedly tubular in this region." The fever kept high, usually running up to 104° in the afternoon; but on the 29th, the seventh day of the attack, it fell suddenly to subnormal, and did not rise again. In short, she passed through a typical attack of croupous pneumonia, and all evidences of consolidation had disappeared from the right apex by the 3rd July. A remarkable point about the case was that the choreic movements became much worse with the first rise of temperature indicative of the pneumonia, and continued so till the




40°

+ 39*

38°

1 37"

- 36°

13



temperature fell again, when they suddenly subsided. They were so violent that the patient had occasionally to be held down in bed. She had not, however, the slightest cerebral disturbance during the whole attack—no delirium, and intelligence perfect throughout. She was dismissed on the 5th August with a normal chest, and all choreic movements gone.

Case S is interesting, not only on account of the nervous symptoms, but also because of the hyperpyrexia, the temperature having on one occasion reached the alarming point of 107°4. This was on the sixth day after his admission to Hospital, and, so far as could be ascertained, the eleventh day of the attack. The patient, a boy of 7, when admitted on the 25th January 1887, had a temperature of 104°; respirations, 56; and pulse, 120. He was delirious, and was said to have been so for two days, his delirium taking the form of shouting and trying to get out of bed. Occasionally he lay quiet and collapsed, with eyes half-closed; pupils reacted to light-no squint ; head somewhat flexed on chest ; great hyperæsthesia of the whole surface of the body; both lungs were affected, and both in their lower portions, the right more than the left. He continued much in the same state till the evening of the 31st January, when his temperature rose suddenly to 107°.4. An hour before it had been taken, and was found to be only 101°. He was put in the wet pack, and had five grains of antipyrin given to him. The fever immediately began to subside, and in three hours it had fallen to 98°.2. It continued to fall, and reached 96° nine hours after its extreme rise, and then began gradually to rise again. The temperature was irregular for a few days longer, reaching 103° on two occasions, but fell finally to normal on the fifteenth day of the attack. The delirium lasted till the morning after the high temperature occurred, and an extraordinary improvement had in that short time taken place in the condition of the child. He is then described in the report as "wonderfully improved, sitting up in bed quite collected, and playing with his toys." The chest physical signs had also changed markedly for the better. On admission he had also a minute trace of albumen in his urine, which, however, soon disappeared. There was nothing remarkable in his family history or home surroundings.

Case 13 is the next with well-marked nervous symptoms. The patient, a boy of 10, was admitted on January 5th, and had been already three days ill. An hour or two after admission his temperature was 104°, and it remained so with little intermission, in spite of cold sponging and antipyrin, till the 10th January, the eighth day of the attack, when it rapidly fell. He had noisy delirium, and complained much of headache. The lower lobe of the right lung was affected, and there was also evidence of a dry pleurisy in the same region. The patient had not a neurotic family history, nor did he appear to be of a specially nervous temperament.

In case 20 the nervous system was specially implicated. It was

also interesting as being to all appearance a clear case of septic pneumonia. The patient, a boy of 8, lived in a dark, damp, badlyventilated room, which was close to a w.-c. The window of the w.-c. opened within a few feet of the window of the room in which patient lived. His illness began suddenly with pain in the belly, vomiting, and headache. Eighteen hours after, he was admitted to Hospital, and was then in high delirium, shouting out loudly. He occasionally tossed the bed-clothes off him, or kept picking at them. He had stiffness of neck and back. His temperature was 105°, pulse 110, and respirations 50. The fever ran high, reaching on the fifth day 106°. The wet pack was then resorted to, and reduced the temperature two degrees. Previous to that antipyrin and cold sponging had had little effect. On the seventh day, after 5 grains of antipyrin, the fever fell to 97°, but immediately rose again, and did not finally fall till the ninth day. The delirium lasted for the first four or five days of the illness. The upper lobe of his right lung was affected, and there was slight catarrh of the left apex for a day or two, which, however, did not go on to consolidation. Patient made a good recovery.

Case 21 was the only other in which head symptoms were prominent. The patient was a boy of 6, admitted on December 16th, 1888, with a history of having been ill for two days. His illness began suddenly while he was at school, with vomiting and severe headache. For two days he continued to vomit everything he took; was thirsty, feverish, and drowsy.

On admission he appeared very ill. His face had a slightly cyanotic hue, and he did not seem to notice anything going on around him. He maintained this dull, apathetic condition throughout his illness, and his delirium assumed a low muttering form. He had well-marked herpes labialis. His temperature, which was $101^{\circ}4$ on admission, two days after had reached 104° , and two days later went up to 105° . Four grains of antipyrin brought it down in four hours to $98^{\circ}8$; but it soon began to rise again, and it remained between 102° and 104° till he died on the 21st, the seventh day of his illness.

He had a double pneumonia, both lungs showing signs of consolidation at their bases on admission, the left more than the right. Gradually the whole left lung became involved, while on the right side the disease remained confined to the base. This was probably a case of septic pneumonia from the commencement, the fatal issue being hastened, if not caused, by farther septic infection from a gangrenous mass in the left lung; but of this more hereafter.

No satisfactory explanation of the occurrence of the nervous symptoms in these cases can be offered. The amount of fever was perhaps an important factor in the production of the nervous phenomena. In the five most marked cases the fever ran very high, in one reaching 107°, and 105° being about the average temperature in the others from the time of admission till the crisis was reached. In the other less-marked nervous cases the fever kept about 103° to 104° during the febrile period. Heredity, perhaps, plays an important part in the causation of the nervous symptoms in these cases, as it probably does in all morbid conditions of the nervous system. There can, I think, be little doubt but that high fever, acting upon an inherited sensitive nervous system in a child, will almost certainly produce more or less wellmarked disturbance of the cerebral and spinal systems. At the same time, it is to me rather a matter of surprise that in children generally in an acute febrile disease like croupous pneumonia we do not get more frequent and far greater disturbance of the nervous system.

Passing now to pleurisy as a complication of these cases, we find that it occurred in six of them, but in only one did it seem of much importance, namely, in No. 11. This case showed the marvellous manner in which a child will sometimes pull through the most hopeless-looking illness. A poor, weakly-looking creature. aged 2; he was admitted on July 6th, 1887, with a temperature of 104°4, a pulse of 144, and breathing 60 to the minute. He had signs of consolidation over the upper lobe of his right lung, and some bronchial catarrh of both lungs. By next day the whole lung had become consolidated and friction was heard at the base. On the 13th the temperature fell, and the little fellow was thought to be on the fair way out of his troubles. The lung physical signs did not improve, however, and the temperature did not keep normal. By the 24th signs of fluid in the right chest became so pronounced that a hypodermic needle was introduced a little below the inferior angle of scapula and pus found. Next day his chest was aspirated, and 4 oz. of pus drawn off. He was so collapsed after the operation that hope of his recovery was almost abandoned. Under free stimulation and by constant attention to his nourishment he rallied, and went on fairly well for some days. He had, however, always an evening rise of temperature, and as there were still signs of fluid in his right chest, he was aspirated again on August 9th, and about 10 oz. of thick pus withdrawn. On the 14th another aspiration was performed, with a like result. and on the 22nd his chest was opened and drained, and about 8 oz. of pus evacuated. Large quantities of pus continued to come away for a day or two, but the discharge gradually lessened, and after the 30th of August the drainage-tube was not re-inserted, and in a few days more the chest opening had completely closed. The pus kept sweet throughout. By the 28th September the report is :-- "Slight relative dulness at right base. Breath sounds normal."

This case shows the wonderful vitality possessed by some children, and often by those in whom a reserve of strength is least expected. He passed safely through a more than usually sharp attack of pneumonia, complicated by a purulent pleurisy and all the necessary operative interference connected with it. At the end of about three months from the commencement of his illness scarcely an abnormal sign could be detected in his chest.

It may be asked why I delayed so long in opening his chest. His collapse and weakness were so profound after the first aspiration that I could not possibly convince myself that he could stand the more severe operation of incision. It was only after his strength had visibly increased under the repeated aspirations, or rather through the time gained by the aspirations, that I could bring myself to feel that he had a fair chance of surviving the greater operation.

The other cases of pleurisy complication do not require much comment, as in them it seemed to have little or no effect on the course of the pneumonia. Case 19 illustrates this well. The patient, a boy of 5, had a decided phthisical family history, and in addition to his pneumonia of lower lobe of left lung, with a pleurisy in the same region, he had a pronounced cardiac affection (mitral incompetency). Immediately preceding his pneumonic attack, also, he apparently had a rheumatic affection of about three weeks' duration. Yet in spite of all this, his pneumonia was of an ordinary five-day type, his temperature never was above 103°, and he left the Hospital three weeks after admission with no abnormal lung signs whatever.

Case 27 was probably recovering from an unnoticed pleurisy when the pneumonic attack occurred. On admission there was flattening and lessening in size of the affected side, and curvature of the spine. The extreme right apex was consolidated. The temperature ran high (104°), but fell on the sixth day, and the child made a perfect recovery. The fresh inflammatory action apparently benefited the old pleurisy, as the chest formation was greatly improved when she left the Hospital, and the right lung expanded freely.

Another somewhat frequent complication of croupous pneumonia is bronchitis. This is not so well recognised as it ought to be, partly, I think, because it is so generally associated with the other variety of pneumonia - the catarrhal. There can be no doubt, however, that cases of croupous pneumonia in children are occasionally met with in which bronchitis exists in the opposite lung, and sometimes, though much more rarely, in the same lung. Henoch states this very clearly and gives some examples. The bronchitis may even run on to a pneumonia, so that you may actually have both kinds of pneumonia in the same patient at the same time, and either in the same or different lungs. In such cases it is extremely difficult to diagnose which kind of pneumonia you have to deal with. The only reliable guide is the temperature chart. A well-marked crisis at the fifth or eighth day will indicate the croupous form as predominating; while a prolonged irregular temperature will denote the catarrhal variety.







Five of the eases related—namely, cases 11, 14, 20, 23, and 29 had at least bronchitis, if not broncho-pneumonia, as a complication, and in all of them I find the fever ran high, and the crisis was delayed usually till the seventh or ninth day. They all had a distinct crisis, however, and from their mode of onset, also, and other symptoms, there was little or no doubt but that they were really cases of croupous pneumonia.

Gastric and intestinal irritation often precede or accompany an attack of eroupous pneumonia in children. High fever in itself no doubt produces digestive disturbance both in adults and children, but vomiting and diarrhœa occur so early in many of these cases that it must be independent of the fever and due to some other cause. I find that vomiting or diarrhœa, or both, were prominent symptoms in nine of the thirty cases before us, and they probably occurred in others, but were not noted. In several of the nine cases the record is—"Illness began suddenly, with vomiting and purging." In one or two of the cases severe abdominal pain was also present, so that the symptoms at the beginning were more those of peritonitis than of pneumonia.

This was particularly the state of matters in case 18. A boy of 3, he was admitted on 21st July 1888, with a temperature of 104°, a pulse of 160, and respirations 52 per minute. Three days before, he had rather suddenly become very drowsy, complained of pain in his head and belly, and vomited several times. After some hours the vomiting ceased, but pain in the belly continued and became worse. On admission, his abdomen was somewhat distended and tender all over. He lay on his back with his legs drawn up. No abnormal chest physical signs could be detected. He remained much in the same state till the 25th, four days after admission, when his left lung was found dull from spine of scapula to base, with tubular breathing over dull area and fine crepitation at end of inspiration.

This, I believe, was one of those pneumonias in which the physical signs were latent or long in developing, and masked by abdominal symptoms. The chart was not typical of pneumonia, the fall of temperature being more gradual than usual, and fever being well down before the pneumonic physical signs had developed.

An examination of the notes and charts of those nine cases, which manifested marked gastrie and intestinal irritation, shows that they were all severe, one or two of them, indeed, dangerously so. The erisis in all of them was delayed. In some of them it took place on the ninth or thirteenth, and in one, case 10, it was the nineteenth day before the temperature reached the normal.

As is well known, if the diarrhea is prolonged, it becomes extremely difficult to diagnose between cronpous pneumonia and typhoid fever. This is illustrated by case 3, a girl of 9, who was admitted to the fever wards of the Hospital on 19th May 1885, as suffering from typhoid fever. Three days later dulness and other signs of pneumonia developed at her right apex, and the true nature of the case becoming evident, she was removed to the general ward.

Having now mentioned a few of the complications, allow me farther to notice some of the peculiarities of croupous pneumonia in children.

The first I would mention is one I have already alluded to as illustrated in case 18, namely, the frequent latency or late development of the physical signs. It is not an uncommon occurrence to have a child suddenly taken ill with high fever, cough, alæ nasi acting, a pneumonic pulse-respiration ratio, and, indeed, with all the general signs of croupous pneumonia, but the most careful examination of the chest quite failing to detect any of the physical signs of a lung affection. Or at least the physical signs will be limited to a faint click at the end of inspiration, or somewhat rough breathing over a portion of one of the lungs. This state of matters may continue for three or four days before anything more definite is manifested in the chest.

Case 5, the girl who was admitted on 11th June 1885 for chorea, and who was attacked with pneumonia eleven days after admission, was a good example of this late development of the physical signs. On that day, 22nd June, her temperature suddenly rose from normal to 102° .6, and pulse and respirations assumed the pneumonic ratio. Her chest was carefully and repeatedly examined; but it was not until the 25th June, three days later, that a shade of dulness was detected at the right apex anteriorly, with an occasional click at the end of inspiration in the same region. These remained the only physical signs till the 27th June, two days later, when the note over the right apex became decidedly dull, and the breathing there markedly tubular.

Case 18 was also an example of this late development of physical signs, as already incidentally pointed out. He was admitted on the 21st of July, but it was not till four days later that his left lung, on examination, gave physical signs of condensation.

Case 15 also illustrated this point. Admitted on 7th May 1888, with a temperature of 104°, respirations 48, and pulse 152, and a troublesome hacking cough, he had no chest physical signs beyond a few moist sounds over both lungs. His illness appears to have been thought rheumatic, as he was treated with salol for the first two days. On 10th May, three days after admission, distinct dulness over the lower half of his right lung was found, with confirmatory auscultatory signs of consolidation. His temperature suddenly fell to sub-normal on the fifth day of his illness, and he passed through a typical attack of croupous pneumonia.

Case 20, which has already been mentioned in illustration of some of the nervous phenomena of pneumonia, also did not show physical chest signs till the fourth day of the illness.

Case 26 ran a typical pneumonic course as regards general







symptoms, but the physical signs were very limited and late in developing. A girl of 13, she was admitted on the 13th of February 1889, with a temperature of 101°, and quickened pulse and respirations, and a history of having been ill for three days. Her chest was carefully examined, and no abnormal signs whatever could be detected. Next day some fine distant crepitation was heard over a small area just below the spine of the right scapula. The day after, a small area of dulness, about 2 inches square, was made out in the same region. No other chest physical signs could be discovered during the whole course of the case, but the temperature fell to 97° on the eighth day of the illness, and all the general symptoms were those of a well-marked example of croupous pneumonia.

Eustace Smith points out this delay in the establishment of the physical signs. He says,—" Often two or three days elapse before any characteristic changes are to be discovered by the finger or the ear."¹ Henoch, in speaking of the difficulties of diagnosis between croupous pneumonia in children and typhoid fever and meningitis, says, "The latency of the physical signs may last from four to six days,"² and attributes the delay to the gradual spread of the pneumonia from the centre of the lung to the periphery, the signs of consolidation only appearing when the inflammation has reached the lung surface. Dr Minot, in his paper on "Croupous Pneumonia" in Keating's *Cyclopædia of the Discases of Children*, quotes a case in which it was not till the sixth day, when the crisis was almost completed, that signs of consolidation, though they had been carefully and repeatedly sought for, could be detected.

Occasionally, I believe, croupous pneumonia in children escapes notice altogether, or at least is not correctly diagnosed on account of this late development and limited nature of physical signs.

I had in my ward about a month ago a little patient in whom, had it not been for his temperature curve, breathing, and pulse, a croupous pneumonia would probably not have been diagnosed. His chest was carefully examined daily, once, if not twice, and it was not till about the fourth day after his admission that a faint puff of fine crepitation was heard at his right apex posteriorly, and the breathing was noticed as slightly bronchial. Almost simultaneously with this his temperature made a sudden fall, and his chart assumed the typical pneumonic curve. If the temperature had not been graphically noted, and his chest carefully examined day after day, it is more than likely, I think, that his illness would have been named a "febricula," or some equally synonymous term for my ignorance.

Another peculiarity in the croupous pneumonia of children, and one which perhaps also leads to difficulties and doubts of diagnosis, is the extremely rapid manner in which the physical

¹ Practical Treatise on Diseases of Children, p. 427.

² Lectures on Children's Diseases, vol. i. p. 403 (New Syden, Soc., 1889).

²⁰

signs, and especially the dulness and other signs of consolidation disappear.

In noticing this rapid change and disappearance of physical signs, Henoch states that in the majority of cases "clear percussion note and normal breathing return after a week, or at latest after ten or fourteen days," and that he had even seen three cases "in which the physical signs were in process of resolution before the crisis commenced." He also quotes Grisolle and Sidlo in support of his statement, the latter of whom remarks that "37.5 per cent. of the cases came to an end forty-one hours on an average before the onset of the crisis, so far as could be made out by physical examination."¹

Twenty-seven of the cases under consideration gave an average duration of fifteen days—that is, fifteen days from the onset of the illness till the date on which the chest gave a clear percussion note and normal breathing.

Case 11, the boy whose pneumonia was ultimately complicated by empyema, was an example of the rapid change of physical signs, due to the sudden extension of the pneumonic process. On admission only the upper lobe gave dulness on percussion and tubular breathing, but by next day the whole lung was consolidated.

Case 15, already mentioned as an example of late development of physical signs, is an excellent illustration of the rapid resolution of the pneumonic consolidation in a child. On 11th May 1888, the report of the state of her chest is as follows:—" Distinct dulness from about middle of scapula to base of right lung, with numerous medium and fine crepitations over this area, and increased vocal resonance." At the left apex there were also signs of consolidation. On 16th May, five days after, the report is :—" Crepitations and other physical signs have practically disappeared. Slight dulness over the right base, with harsh breathing, alone remain."

Case 25 is interesting, not only on account of the sudden changes in the chest physical signs, but also as being a case in which a relapse or second pneumonic attack occurred about eighteen days after the first. A little girl of 21, she was admitted on 26th January 1889, with signs of pneumonia, confined entirely to the base of her right lung. By next day there were signs of the whole lung having become involved. The fever fell to normal on the 28th, but rose to 100° next day. The following day it again fell, this time to sub-normal, and did not rise again. On the same day it was noted that dulness and tubular breathing had quite disappeared from the right lung, only some redux crepitation remaining. Patient went on well till the 18th February, when a sudden rise of temperature (103°6) took place. Next day crepitation, fine and medium, was heard at both bases, but specially marked over right base, where there was also some dulness on percussion. Temperature fell to normal on 24th February, and by the 27th the chest ¹ Lectures on Children's Diseases, vol. i. p. 411.

was noted as free from all abnormal signs. Not content with her two attacks of pneumonia, she ended a week or two later by taking chicken-pox.

These sudden changes in the physical signs in the pneumonias of children must be puzzling to any one beginning the study of their diseases, and may even lead to doubts as to correctness of diagnosis. Such changes are of frequent occurrence, and ought to be expected. It is well to bear in mind also that the fine pneumonic crepitation so constant in the adult during the inflammatory stage, is often not heard in the child, probably because its inspirations are too shallow to produce it. So also redux crepitation is often absent in children.

Passing from these peculiarities in the physical signs, another circumstance worth noticing in the Croupous Pneumonias of children is the comparative ease and safety with which they pass through the attack. Notwithstanding bad family history and insanitary home surroundings, the great majority of the cases end in recovery. Even grave complications, such as pleurisy and empyema or heart affection, are successfully battled with and overcome. The records before us furnish examples of severely complicated cases making good recoveries. Some of them have already been mentioned, and sufficiently emphasize the point, without my occupying more of your time selecting and bringing forward others.

Let me now say a word or two regarding the two fatal cases. Case 21, a boy of 6, died on the seventh day of his illness. He was admitted on the 16th December 1888. His illness began two days before with severe vomiting. He soon became drowsy and very feverish. On admission, his temperature was 101°.4, respirations 42, and pulse 110. Patient looked very ill, and was somewhat eyanosed. Left lung consolidated from spine of scapula downwards; right lung also in its lower fourth. The whole of the left lung ultimately became solid, the pneumonic process extending to the front as well as back. His temperature soon after admission reached 104°, and, except for a few hours after four grains of antifebrin, fell little from that point till the time of his death on the 21st. Increasing weakness prevented repetition of the antifebrin, and frequent tepid sponging was resorted to instead to reduce fever. Digitalis, carbonate of ammonia, ether, and alcohol were freely administered, but were of no avail.

At the post-mortem the left lung was found wholly consolidated, and at its base a gangrenous mass with a small cavity in its centre. The bronchi of the lower lobe were filled with firm fibrinous clot. Right lung was found engorged, with collapsed areas, and commencing catarrhal pneumonia, especially in the upper lobe. Lower lobe cedematous. All the cavities of the heart filled with dark coloured clot. Valves normal.

Patient evidently died, therefore, from gangrene of his left lung of the circumscribed variety. Possibly it was embolic in its origin. Bouillard states that blood coagula are apt to form during the pneumonic process, and all the cavities of the heart were certainly found filled with dark-coloured clot. Or the gangrenous condition may have been produced through the obstruction to the circulation by the distended condition of the bronchi, which were found erammed with a fibrinous material.

This condition was not suspected during life. The diagnosis of gangrene of the lung in children is attended with special difficulty, as they seldom or never expectorate, and hence the chief sign of pulmonary gangrene, namely, foctid expectoration, is usually wanting. Except that the child looked very ill and depressed, there was no other symptom pointing to such a grave condition of lung.

Case 30 was the other fatal case. A child of only 18 months, he was a good example of the extraordinary vitality which even some very young children show. He sustained two, if not three attacks of pneumonia, and then took measles. He struggled on for several weeks, but his chest never cleared. Fever persisted, and he wasted and died from exhaustion.

He was admitted on the 22nd November 1889 with a wellmarked attack of pneumonia, affecting the whole of his left lung. His history was that he had been two days ill from his present attack, but that a month previously he had had also an inflammatory chest affection, which was probably pneumonic. His present attack was severe, but he came safely through it, and his chest was reported normal on December 10th. On the 16th December his temperature rose again, and two days later pneumonic signs were detected, and again in the left lung. He seemed as if he were to do well in this attack also, as his temperature fell to subnormal on the 21st. Twenty-four hours later it rose again, however, and the lung consolidation did not clear away. On the 27th a measle rash appeared, and he was removed to the Fever Hospital. He was re-admitted on the 29th January 1890. He was now much emaciated, and had signs of a pleuro-pneumonia on the left side of his chest, with numerous rhonchi and medium erepitation heard all over both lungs. He gradually became weaker, and died on February 7th.

At the post-mortem the left lung was found adherent to the chest wall almost throughout its whole extent, and also to the diaphragm. The lower lobe was collapsed and condensed. Right lung was congested with patches of collapse at its free margins, and some signs of commencing catarrhal pneumonia. Glands at the roots of the lungs enlarged and tubercular. Liver and spleen also tubercular.

The treatment adopted in these cases was mainly expectant, and therefore little need be said of it. Continuous hot moist applications to the chest were not employed. Such applications I believe do harm. They impede the movements of the chest by their weight, tend to increase fever, and generally are anything but comfortable.

All the counter-irritation required was secured by the application, to the back of the chest, of a few hot linseed meal poultices sprinkled over with a little mustard. Each poultice was kept on for about twenty minutes, and in the intervals the chest was enveloped in a light layer of cotton wool. Internally, if the cough was troublesome, an occasional dose, according to age, of a mixture of equal parts of syrup of tolu and syrup of chloral was given. If the patient seemed getting exhausted, and the pulse was becoming rapid and feeble, the chloral and tolu mixture was stopped, and a mixture of carbonate of ammonia, tincture of digitalis, and infusion of senega given instead. This mixture was often required about the time of the crisis or immediately after, as already mentioned. Alcohol was also usually given at this time.

As regards antipyretics, I find tepid sponging is by far the safest and most effective means of bringing down temperature in children. It is easily carried out, and a skilful nurse can sponge the patient as often as necessary without in the least disturbing or exposing him. My rule is to sponge whenever the temperature reaches 103_2° , and to do so every two hours till the fever is reduced two degrees. Antipyretics, such as antipyrin and antifebrin, were given in some of the cases also, and usually with good effect. Occasionally, however, the effect was greater than expected, and the consequent exhaustion was more pronounced than desirable. For that reason chiefly I prefer the sponging, unless in a case of hyperpyrexia, as in the cases where the temperature ran up to 106° and 107°, when antipyrin and antifebrin were used and the wet pack also resorted to. I prefer antipyrin to antifebrin as being decidedly less depressing.

During convalescence, iron, maltine, and cod-liver oil were the chief medicinal agents relied upon.

Professor Greenfield congratulated Dr Playfair upon his very valuable contribution to the study of pneumonia. The frequency of acute lobar pneumonia in children was apt to be overlooked. But he thought too much might be made of the supposed differences in the phenomena of pneumonia in children as compared with adults. He had recently made an analysis of a series of cases under his care in the Royal Infirmary, mostly in adults, and of a number about equal to those tabulated by Dr Playfair. From his experience he could say that in several respects, such as the latency of the physical signs, the duration and course, and the character of the complications, an almost exact parallel might be drawn. But they were undoubtedly points to which more attention should be directed, both in children and in adults.

Dr Alex. James said that with the previous speaker he wished to express the pleasure which he had felt in listening to this paper, and the interest with which he looked forward to its careful perusal by-and-by in a printed form. At present what he had to remark was, that though in most respects young and adult pneumonias were really more alike than they may have appeared to be, and that this is perhaps specially the case as regards physical signs,-the dulness, etc., often not showing till close on to the crisis, -yet that as regards symptoms the great latency in children is usually very marked. Expectoration in children is not to be looked for, but chest pain and cough are often not present, or at any rate not observed, so that we often see what has been supposed to be a typhoid fever or a meningitis turn out to be an acute pneumonia. The statement that in children an upper lobe pneumonia is as favourable as a lower lobe affection appears a little peculiar. It is different from what we believe to be the case in the adult, and is interesting in connexion with the fact that in children's phthisis the lower parts of the lung are-proportionally to the adult-more frequently the seat of disease. But may not this apparently less serious upper lobe pneumonia of the child be explained by the fact that the disease runs a more favourable course in children, whether affecting either upper or lower lobe?

Dr James Ritchie found nervous symptoms to be most severe in pneumonias of debilitated persons somewhat advanced in life; in children he did not find that these symptoms were affected by the portion of lung involved, but partly by the amount of fever, and to a much greater degree by the constitution of the child. The relation of bronchitis to pneumonia he found to be varied. He had met with many cases commencing with the physical signs of bronchitis over both lungs, but suddenly these had entirely disappeared and been replaced by those of croupous pneumonia affecting one lobe. Many cases of so-called late development of physical signs he believed to be central pneumonias, but he had frequently found in children that a common situation for the early detection of physical signs was the upper part of the lower lobe of the lung in the axillary line. He had found poultices most efficacious, soothing to the patient, and he found that when not applied very hot, and changed only every four or six hours, they lowered the temperature. If they were found to be irksome he used a jaconet jacket lined with cotton wool, and had a stimulant applied to the skin. He rarely used expectorants in the pneumonias of children. If any tendency to flag, carbonate of ammonia and digitalis. Antipyrin and antifebrin he thought prejudicial, unless in hyperpyrexia. He preferred cold sponging.

Dr H. M. Church asked whether, in any of the cases which were complicated with empyema, the pus had been found sacculated about the apex of the lung; for in such cases the diagnosis was often difficult, especially if there was dulness at the base of the lung. In these cases exploratory punctures were disappointing, if made at the usual points at the lower part of the lung. He inquired by what means Dr Playfair had kept his cases of empyema aseptic after operation. Dr Church had, during the winter, met with two cases of the kind. He also thought that antipyrin and antifebrin should be given cautiously, and with due regard to their compatibility with other drugs. For instance, if antipyrin and sweet spirits of nitre are given together, a compound of the nature of carbolic acid is formed, which might be injurious to the patient.

Dr Playfair cordially thanked the members for their very kind reception of his paper. He agreed with Prof. Greenfield that the physical signs of pneumonia were often delayed in the adult as well as in the child, but thought the delay was more marked in the child. As to antipyretics, he had no doubt whatever but that they acted generally much more decidedly and quickly in children than in adults. He agreed with Dr Ritchie that a high temperature was not the sole cause of nervous complications in the diseases of children. In reply to Dr Church, the chest in the empyema case was opened and dressed under a douche of corrosive sublimate solution. He never had any difficulty in thus keeping such cases antiseptic throughout.



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PRINTED BY OLIVER AND BOYD, EDINBURGH.









